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INFLUENCE OF A SECTOR GROUND SCREEN ON THE FIELD OF A VERTICAL ANTENNA

by

James R. Wait and Lillie C. Walters

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INFLUENCE OF A SECTOR GROUND SCREEN ON THE FIELD OF A VERTICAL ANTENNA

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Abstract

The field of a short vertical antenna on a homogeneous ground is shown to be modified by the presence of a metallic screen. The screen is taken in the form of a circular disc and a concentric sector. The modification of the field is expressed in the form of surface integrals over the disc and the sector. Extensive numerical results for these basic integrals are given and a number of applications are illustrated.

1. Introduction

The influence of the ground on the fields of antennas has been discussed sporadically in the literature for many years. In most propagation calculations it is assumed that the transmitting antenna has a fixed dipole moment and the ground is taken to be a perfect conductor or possibly a homogeneous imperfectly conducting half space. In practice, however, some kind of ground system is used. Usually this takes the form of a metal screen or radial wire system which is on the surface of the ground or may be buried slightly beneath the surface. The design of such systems has been typically empirical. Apparently, the first analytical approach was carried out by Brown et al[1]. Later works[2,3] have dealt mainly with the influence of the ground system on the impedance. In most cases it has been assumed that the radiated field for a given current on the antenna was not appreciably affected by the presence of the ground screen. In fact, an approximate analytical method was given previously by Wait and Pope[4] which is suitable for estimating the dependence of the ground wave on the size of a circular ground screen. Calculations[5] based on this work supported the contention that a screen has only a small effect on the radiated field provided the radius of the screen is of the order of a wavelength or less. Very similar conclusions have been arrived at by British workers[6,7].

In this paper consideration is given to ground screens which may be large in terms of a wavelength. Since the theory has been treated quite generally in a previous paper[8], attention will be focussed here on the numerical calculations and the predicted performance.

2. Formulation and Description of Problem

The situation is described as follows. A vertical electric dipole is located on a flat homogeneous ground of conductivity σ and dielectric constant ϵ. The vertical electric field E at a distance R_o and elevation angle ψ_o is given as follows

$$E_v = \frac{i\mu_o \omega \ell I}{2\pi R_o} e^{-ikR_o} \cos^2 \psi_o \, W(R_o, Z) \tag{1}$$

where

$\mu_o = 4\pi \times 10^{-7}$

ω = angular frequency

ℓ = effective height of transmitting dipole

I = current at terminals of transmitting dipole

k = 2π/wavelength .

In the above, $W(R_o, Z)$ is a complex quantity which is a function of the surface impedance Z of the ground. Over a perfectly conducting ground, W would approach unity. In the case of finite ground conductivity[9]

$$W(R_o, Z) \cong 1 - i(\pi p_o)^{\frac{1}{2}} e^{-w_o} \operatorname{erfc}(i w_o^{\frac{1}{2}}) \tag{2}$$

where

$$w_o = [1 + (\eta_o/Z) \sin \psi_o]^2 \, p_o \, , \tag{3a}$$

$$p_o = -\frac{ikR_o}{2} \left(\frac{Z}{\eta_o}\right)^2 , \tag{3b}$$

and $\eta_o = 120\pi$.

This result is valid for $kR_o >> 1$ and $|Z/\eta_o|^2 << 1$. If

$$Z = \left(\frac{i\mu_o \omega}{\sigma + i\epsilon\omega}\right)^{\frac{1}{2}} \left[1 - \frac{i\epsilon_o \omega}{\sigma + i\epsilon\omega} \cos^2 \psi_o\right]^{\frac{1}{2}}, \tag{4}$$

the expression for W coincides exactly with the result given by Norton[10] for the same situation. It may be noted that this value of Z is exactly equal to the ratio of the tangential electric and magnetic fields for a vertically polarized plane wave incident at an angle $90^\circ - \psi_o$ on the homogeneous flat ground.

In applications to practical communication problems it is very convenient to split off the surface wave portion W_s by writing

$$W = W_r + W_s \tag{5}$$

where, by definition,

$W_r = [1 + R_v(\psi_o)]/2$ is the radiation or space wave field, and

$$R_v = \frac{\sin\psi_o - Z/\eta_o}{\sin\psi_o + Z/\eta_o} \tag{6}$$

is the Fresnel reflection coefficient. This decomposition of the total field into space and surface wave was first made by Norton[10] and it is a convenient procedure in radio engineering since, by definition, W_r is the radiation pattern of the antenna in the presence of the ground plane. It may be the dominant term in many cases of practical interest

although as ψ_o approaches zero W_r actually vanishes. Methods for estimating the relative importance of W_s are given in the papers by Norton[10].

The central task in the present paper is to indicate how a wire mesh or a similar metal screen lying on the ground will modify the field at the receiving antenna. The surface impedance is assumed to be modified to Z' over the area of the screen but remains the same outside the screen. The field E'_v in the presence of the screen is then written

$$E'_v = \frac{i\mu_o \omega \ell I}{2\pi R_o} e^{-ikR_o} \cos^2 \psi_o \, W'(R_o, Z, Z') , \qquad (7)$$

where W' is an unknown complex quantity which is now a function of Z' in addition to R_o and Z. The quantity W' reduces to W if $Z' = Z$.

In a previous paper[8] an integral equation for W' was obtained by an application of the Lorentz reciprocity theorem. Although it would be possible to solve this equation directly using a digital computer it was indicated that a first order iteration was satisfactory. In this case it was found that

$$W'(R, Z, Z') \cong W(R, Z) [1 + \Omega] \qquad (8)$$

where Ω is the fractional change of the field due to the presence of the screen. Within the approximations stated, the factor Ω can be regarded as the modification of the effective height of the transmitting antenna, since it influences W_r and W_s to the same extent.

Before proceeding further it is convenient to introduce a polar coordinate system (ρ, ϕ) centered at the source dipole as indicated in Fig. 1. Thus an element of area of the ground plane is $\rho \, d\phi \, d\rho$.

From the analysis in the previous paper by Wait[8], it was shown that

$$\Omega \cong - \frac{ik}{2\pi \cos \psi_o} \iint_S e^{-ik\rho} \, e^{-ik(R-R_o)} \left(\frac{Z' - Z}{\eta_o}\right)$$

$$\times \left(1 + \frac{1}{ik\rho}\right) (\cos \phi) \, d\phi \, d\rho \ , \qquad (9)$$

where

$$R = [\rho^2 + d^2 + h^2 - 2\rho \, d \cos \phi]^{\frac{1}{2}}$$

$$R_o = (d^2 + h^2)^{\frac{1}{2}} \ , \quad h = R_o \sin \psi_o$$

and $\qquad d = R_o \cos \psi_o$.

The integral may be evaluated when the shape of the ground screen is specified. In the following, attention will be confined to screens which are in the form of a sector. A special case is a circular screen, and this is considered first.

3. The Circular Screen

Over the range $0 < \rho < a$ it is assumed that the surface impedance is $Z' = Z'_a$. Beyond the screen (i.e., $\rho > a$), $Z' = Z$. Furthermore, it is assumed that the receiving antenna is in the far field such that

$$R - R_o \cong - \rho \cos\phi \cos\psi_o \quad .$$

Thus

$$\Omega_a \cong - \frac{ik}{2\pi \cos\psi_o} \int_{\rho=0}^{a} \int_{\phi=-\pi}^{\pi} e^{-ik\rho}\left(1 + \frac{1}{ik\rho}\right) e^{ik\rho\cos\phi\cos\psi_o} \times \cos\phi \left(\frac{Z'_a - Z}{\eta_o}\right) d\phi \, d\rho \quad . \tag{10}$$

If Z'_a does not depend on ϕ the integration with respect to ϕ may be readily carried out to give

$$\Omega_a \cong \frac{k}{\cos\psi_o} \int_{\rho=0}^{a} e^{-ik\rho}\left(1 + \frac{1}{ik\rho}\right) J_1(k\rho\cos\psi_o)\left(\frac{Z'_a - Z}{\eta_o}\right) d\rho \; , \tag{11}$$

where J_1 is the Bessel function of the first type of order one. When dealing with large screens the argument $k\rho \cos\psi_o$ can be regarded as a large quantity over the major portions of the integrand. Thus, J_1 may be replaced by the first term of its asymptotic expansion. Therefore,

$$\Omega_a \cong - \left(\frac{i}{2\pi\cos^3\psi_o}\right)^{\frac{1}{2}} \int_0^{ka} \left(\frac{Z'_a - Z}{\eta_o}\right)\left(1 - ie^{-2ix\cos\psi_o}\right) \frac{e^{-ix(1-\cos\psi_o)}}{x^{\frac{1}{2}}} \, dx \; . \tag{12}$$

When Z'_a is essentially constant over the range of integration, Ω_a can be expressed in terms of Fresnel integrals. After a change of variable it readily follows that

$$\Omega_a \cong \frac{Z - Z'_a}{\eta_o} e^{-i\pi/4} G$$

where

$$G = \frac{i}{(2\cos^3\psi_o)^{\frac{1}{2}}} \left[\frac{1}{\sin(\psi_o/2)} \int_0^{(4ka/\pi)^{\frac{1}{2}}\sin(\psi_o/2)} \exp[-i(\pi/2)t^2]\, dt \right.$$

$$\left. - \frac{i}{\cos(\psi_o/2)} \int_0^{(4ka/\pi)^{\frac{1}{2}}\cos(\psi_o/2)} \exp[-i(\pi/2)t^2]\, dt \right] . \tag{13a}$$

As ψ_o approaches zero the above equation reduces to

$$G = i\left(\frac{2ka}{\pi}\right)^{\frac{1}{2}} \left[1 - i\left(\frac{\pi}{4ka}\right)^{\frac{1}{2}} \int_0^{(4ka/\pi)^{\frac{1}{2}}} \exp[-i(\pi/2)t^2]\, dt \right] , \tag{13b}$$

and if $ka >> 1$ this may be approximated by

$$G \cong i\left(\frac{2ka}{\pi}\right)^{\frac{1}{2}} \left[1 - \left(\frac{i\pi}{8ka}\right)^{\frac{1}{2}} \right] \cong i\left(\frac{2ka}{\pi}\right)^{\frac{1}{2}} . \tag{14}$$

It is interesting to note that, if the integral in (12) is evaluated by a stationary phase method, the second Fresnel integral in the square bracket term of (13a) is not present. This would correspond to the approximation usually employed in the practical theories of mixed-path ground wave propagation. The value of G corresponding to this situation is denoted G(1).

Numerical values of the integrals G and G(1) are given in Table 1. The values of ka (denoted KA) take the values 5, 10, 20, 30, and 100, while ψ_o (denoted PSI) runs from 0° to 45°. It is immediately evident that, for small values of ψ_o (i.e., near grazing), the integrals G and G(1) are not significantly different. As will be clear from the following section the integral G(1) would correspond physically to the situation where the screen is semicircular in shape (i.e., ϕ extends from $\pi/2$ to $-\pi/2$ only).

To illustrate the application of the results in Table 1, values of the complex quantity $1 + \Omega_a$ have been computed for several values of the surface impedances of the ground plane. For this purpose it is convenient to write

$$\frac{Z - Z_a'}{\eta_o} = \frac{1}{N} e^{i\beta} \tag{15}$$

where N and β are real. If the ground screen is a metal sheet $Z_a' << Z$ and, consequently, $Ne^{-i\beta}$ could be regarded as the complex refractive index of the ground itself. However, in general, N and β have a more general meaning as defined by (15). Taking $N = 3$ and $\beta = 0^\circ$, the amplitude and phase of $1 + \Omega_a$ are shown plotted in

Figs. 2a and 2b, respectively, as a function of ψ_o for various values of ka. It is emphasized that such curves should not be regarded as radiation patterns but rather as modifications of the effective height of the transmitting antenna due to the ground screen. It is apparent that for the low angles involved in HF communication the ground screen will increase the effective height of the transmitting antenna by a significant amount. The value of N given in this example corresponds to a dielectric constant of 3^2 or 9 which is typical of very dry ground. The effect of choosing a large value of N is shown in Figs. 3a and 3b where $N = 10$ and $\beta = 0^o$. The curves are very similar in shape but the over-all effectiveness of the ground screen is reduced somewhat.

The value of β, as defined by (15), determines the phase of the complex refractive index of the ground. For a very dry or nonconducting ground β is zero as indicated in Figs. 2a to 3b. However, when the conductivity becomes important β may be greater than zero. In fact, for a highly conducting ground where displacement currents are negligible, β may approach 45^o. To illustrate the influence of finite β, the amplitude and phase of $1 + \Omega_a$ are shown in Figs. 4a and 4b for $ka = 20$, $N = 10$, and various values of β between 0^o and 45^o. It is evident from these curves that the presence of the conduction currents tends to diminish the amplitude but it does increase the phase.

It is becoming apparent that at the lower frequencies and highly conducting ground the presence of the ground screen has a small effect on the total field (for a given strength $I\ell$ of the source dipole). To illustrate this point, the amplitude and phase of $1 + \Omega_a$ are shown in Figs. 5a and 5b for $ka = 20$ and $\beta = 45^o$ for $N = 10$ and 30. The

4. The Sector Screen

It is clear from the previous results that a large circular ground screen will, indeed, improve the low angle radiation from a ground-based vertical antenna. However, one might ask if any portions of the circular ground screen could be removed without materially affecting the performance of the system. This is certainly a valid question. In the first place, it is known[5] that the impedance of the antenna is not affected by anything beyond about one-half wavelength from the antenna. Therefore, to throw some light on the question posed above, the ground screen is taken to be in the form of a sector extending from $\rho = a$ to $\rho = b$ from the base of the transmitting antenna. From $\rho = 0$ out to $\rho = a$ the screen is circular in shape. The situation is illustrated in Fig. 6. The surface impedance over the area of the sector is Z_b. In terms of the polar coordinate system (ρ, ϕ), the area of the sector is defined by $-\Delta_1 < \phi < \Delta_2$ and $a < \rho < b$.

It is convenient to express the factor Ω as the sum of two parts in the manner

$$\Omega = \Omega_a + \Omega_b \tag{16}$$

where Ω_a is the contribution from the circular screen of radius a and Ω_b is the contribution from the sector which extends from a to b. The portion Ω_b can be written

$$\Omega_b = -\frac{ik}{2\pi \cos\psi_o} \int_{\rho=a}^{b} \int_{\phi=-\Delta_1}^{\Delta_2} e^{-ik\rho}\left(1 + \frac{1}{ik\rho}\right) e^{ik\rho\cos\phi\cos\psi_o} \times \cos\phi \left(\frac{Z_b' - Z}{\eta_o}\right) d\phi \, d\rho \tag{17}$$

where the receiving antenna is assumed to be in the plane $\phi = 0$. The integral for Ω_b given above is sufficiently general to determine the effect of the sector as a function of elevation and azimuth angle. Actually, the integral is analogous to (10) for the circular screen where the limits of ϕ extend from $-\pi$ to π. As before, only first-order phase terms are retained so that the receiving antenna must be in the far field.† The extension to the near-field case has been considered previously by Wait[8]. In actual communication circuits the receiving antenna would always be in the far field.

To evaluate the integral in (17) it is convenient to use the approximation

$$\cos \phi = 1 - \frac{\phi^2}{2}$$

for the exponent in the integrand while the factor $\cos \phi$ is replaced by unity. This is valid since the principal contributions correspond to small values of ϕ. An interesting check on this statement is given below.

Following the procedure used in the previous section, a dimensionless function G_b is introduced by setting

$$\Omega_b = \frac{Z - Z_b'}{\eta_o} e^{-i\pi/4} G_b \quad . \tag{18}$$

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† This far-field condition can be written

$$k R_o \left[\left(1 + \frac{\rho^2}{R_o^2} - \frac{2\rho d}{R_o^2} \cos \phi\right)^{\frac{1}{2}} - 1 \right] - \frac{k\rho d}{R_o} \cos \phi < \frac{\pi}{4} \ .$$

The integral for G_b may now be written in the form

$$G_b = \frac{i}{(2\pi)^{\frac{1}{2}} \cos^{3/2} \psi_o} \int_{ka}^{kb} \frac{e^{-ix(1 - \cos \psi_o)}}{x^{\frac{1}{2}}} F(x) \, dx \quad , \tag{19}$$

where

$$F(x) = \frac{1}{1-i} \int_{-\Delta_1 [(x/\pi) \cos \psi_o]^{\frac{1}{2}}}^{\Delta_2 [(x/\pi) \cos \psi_o]^{\frac{1}{2}}} \exp[-i \frac{\pi}{2} t^2] \, dt \quad .$$

The Fresnel integral $F(x)$ is normalized so that $\lim\limits_{x \to \infty} F(x) = 1$, provided Δ_1 and Δ_2 are both positive. In this limiting case the sector is behaving essentially as a circular screen. For example, one may note that

$$\dot{G}_b \Big]_{x=\infty} = G_1(kb) - G_1(ka) \, ,$$

where G_1 is the integral described by omitting the second term of (13a).

An interesting special case of (19) is when $\psi_o \to 0$ and Z_b' can be regarded as a constant. Then

$$G_b = i \left(\frac{1}{2\pi}\right)^{\frac{1}{2}} \int_{ka}^{kb} \frac{F(x)}{x^{\frac{1}{2}}} \, dx \quad . \tag{20}$$

After an integration by parts it readily follows that

$$G_b = i\left(\frac{2kb}{\pi}\right)^{\frac{1}{2}} \left\{ F(kb) - \left(\frac{2}{\pi kb}\right)^{\frac{1}{2}} e^{i3\pi/4} \left[\frac{\exp(-ikb\,\Delta_2^2/2)}{2\,\Delta_2} + \frac{\exp(-ikb\,\Delta_1^2/2)}{2\,\Delta_1}\right] \right.$$

$$\left. - \left(\frac{a}{b}\right)^{\frac{1}{2}} \left[F(ka) - \left(\frac{2}{\pi ka}\right)^{\frac{1}{2}} e^{i3\pi/4} \left(\frac{\exp(-ika\,\Delta_2^2/2)}{2\,\Delta_2} + \frac{\exp(-ika\,\Delta_1^2/2)}{2\,\Delta_1}\right)\right] \right\} \tag{21}$$

The integral G_b has been evaluated for a range of values of kb. To simplify the situation, the lower limit ka is fixed at 5 and $\Delta_1 = \Delta_2 = \Delta$. The numerical results for G_b [denoted G(B)] are given in Tables 2 to 8 for Δ [DELTA] ranging from 5° to 60°. Within each table kb [KB] varies from 10 to 100 and ψ_o [PSI] varies from 0° to 45°.

As a check on the numerical work, G_b for $\psi_o = 0$ was calculated using both (19) and (21). Also, it may be noted that

$$G_b(kb)\Big]_{\Delta\to\infty} = G_1(kb) - G_1(5)$$

where the values of $G_1(x)$ are listed in Table 1 and where x is to be identified with KA.

To illustrate the effect of a finite value of Δ, some typical cases are shown in Figs. 7a and 7b where the amplitude and phase of G_b are plotted as a function of ψ_o for $ka = 5$, $kb = 40$, and various values of Δ. It appears that for these conditions the total sector angle 2Δ need not be greater than about 50° in order to be fully effective.

In order to demonstrate the effect of the sector on the total field it is convenient to consider both Z'_a and Z'_b small compared with Z. Thus

$$\frac{Z - Z'_b}{\eta_o} \cong \frac{Z - Z'_a}{\eta_o} \cong \frac{Z}{\eta_o} \cong \frac{1}{N} e^{i\beta}$$

where $N e^{-i\beta}$ is the complex refractive index of the ground. Consequently, it follows from (16) that

$$1 + \Omega = 1 + \Omega_a + \Omega_b \cong 1 + \frac{e^{i(\beta - \pi/4)}}{N} (G_a + G_b) \quad .$$

The amplitude of this quantity (expressed in db) and the phase are shown in Figs. 8a and 8b for $ka = 5$, $kb = 40$, $\beta = 0$, and $N = 3$. This would correspond to a relatively dry soil. It is certainly evident here that considerable improvement results from the presence of the sector. The corresponding set of curves shown in Figs. 9a and 9b are for a highly conducting soil characterized by $N = 10$ and $\beta = 45^\circ$. The sector screen here has a negligible effect on the performance of the system. In fact, there is even a slight degradation for the very low grazing angles.

The marked improvement by using a large sector screen on a dry ground is indicated in Fig. 10. Here $ka = 5$, $kb = 200$, $N = 3$, and $\beta = 0$. At low angles the gain is greater than 12 db even with a total sector angle, 2Δ, of 20°.

In the preceding discussion it has been tacitly assumed that the receiving antenna is located in the vertical plane which bisects the sector. Normally, this would be the optimum location,and for a fixed communication link it would be considered good practice to orient the sector towards the receiving antenna. However, there may be certain applications where the receiving antenna is located off the center line. The formulae given above are actually valid for this case since Δ_1 and Δ_2 may take any positive or negative value. However, rather than computing directly from the general formulae, it is desirable to establish some simple identities which enable the results in Tables 2 to 8 to be used.

It may be readily verified that $G_b(\Delta_1, \Delta_2)$, as defined by (18), has the following property

$$G_b(\Delta_1, \Delta_2) = \frac{G_b(\Delta_1, \Delta_1) + G_b(\Delta_2, \Delta_2)}{2} = \frac{G_b(\Delta_1) + G_b(\Delta_2)}{2} .$$

Numerical values of $G_b(\Delta, \Delta)$ or $G_b(\Delta)$ for various positive values of Δ are given in Tables 2 to 8 inclusive. If negative values of Δ are encountered it is useful to note that

$$G_b(\Delta) = - G_b(-\Delta) .$$

With this information it is a simple matter to compute $(1 + \Omega)$ as a function of the azimuth angle δ which is defined by

$$\delta = (\Delta_2 - \Delta_1)/2 .$$

Thus

$$1 + \Omega_a + \Omega_b \cong 1 + \frac{Z - Z'_a}{\eta_o} G_a e^{-i\pi/4} + \frac{Z - Z'_b}{\eta_o} e^{-i\pi/4} G(\Delta_1, \Delta_2) , \quad (22)$$

which is an obvious generalization of (18).

To illustrate the azimuthal variation of the field when using a sector it is again desirable to write

$$\frac{Z - Z'_a}{\eta_o} \cong \frac{Z - Z'_b}{\eta_o} \cong \frac{Z}{\eta_o} \cong \frac{1}{N} e^{i\beta} .$$

Then again denoting the total width of the sector by 2Δ, the amplitudes of $1 + \Omega_a + \Omega_b$ are shown in Figs. 11 and 12 for $N = 3$, $\beta = 0$, $ka = 5$, $\Delta = 20^o$, and various values of ψ_o from 0^o to 25^o. In Fig. 11, $kb = 40$ whereas in Fig. 12, $kb = 200$. As expected, the maximum response corresponds to small values of δ. In fact, as δ increases the response decreases quite significantly for the larger sector.

5. Final Remarks

In the present study, the electrical properties of the ground are assumed to be characterized by a surface impedance which is a (complex) constant Z outside a surface S. Within S, the impedance Z' is allowed to be variable. In the case of a radial wire system emanating from Q, it is appropriate to use formulae which have been developed for the surface of a wire grid in the interface of a conducting half space[11]. In general these are complicated, but recently some numerical results have been obtained which should be useful in this problem.[†] At low radio frequencies for moderately or well-conducting soils it is a satisfactory approximation to regard the surface Z' as the parallel combination of the surface impedance Z_s of the equivalent grid and the ground beneath. Thus

$$Z' \cong \frac{Z_s Z}{Z + Z_s} , \tag{23}$$

where

$$Z_s \cong \frac{i\,\eta_o d}{\lambda_o} \log_e \frac{d}{2\pi c} , \tag{24}$$

$$Z \cong (i\,\mu_o \omega/\sigma)^{\frac{1}{2}} ,$$

and d is the spacing between the radial conductors and c is the radius of the wires. Such a formula is strictly valid only if $(\sigma \mu_o \omega)^{\frac{1}{2}} d << 1$ everywhere within the ground system. If there are N radial conductors, it can be seen that d can be replaced by $2\pi\rho/N$ where N is usually of the order of 100.

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† Available from Mrs. T. Larsen, Laboratory of Electromagnetic Theory, Technical University of Denmark, Copenhagen.

6. Appendix

(1.) Evaluation of the Fresnel integral

The integrals occurring in G (13a), (13b), and F(x), (19) are of the type

$$f(u) = \int_0^u e^{-(i/2)\pi t^2}\, dt = C(u) - i\, S(u) \quad . \tag{25}$$

These Fresnel integrals were evaluated by the method proposed by Boersma[12]. . This method is based on the τ method of Lanczos[13]. The Fresnel integral defined by Boersma is

$$f(x) = \int_0^x \frac{e^{-it}}{\sqrt{2\pi t}}\, dt = C(x) - i\, S(x) \tag{26}$$

The definition in (25) conforms to the one used by Boersma[14] in equation (26) if

$$x = \frac{\pi u^2}{2} \quad .$$

For values of the argument $0 \leqq x \leqq 4$ in (26), $f(x)$ is computed by a finite power series in x; for values of the argument $x \geqq 4$, $f(x)$ is approximated by a polynomial in $1/x$. For $n = 12$, the power series in x valid for $0 \leqq x \leqq 4$ is

$$f(x) \cong e^{-ix}\sqrt{\frac{x}{4}} \sum_0^{11} (a_n + i\, b_n)\left(\frac{x}{4}\right)^n \quad . \tag{27}$$

The power series in $\frac{1}{x}$, valid for $x \geq 4$ is

$$f(x) \cong \frac{1-i}{2} + e^{-ix}\sqrt{\frac{4}{x}} \sum_{0}^{11} (c_n + i\, d_n)\left(\frac{4}{x}\right)^n . \tag{28}$$

The numerical values of the coefficients a_n, b_n, c_n, and d_n as developed by Boersma[14,12] are given in Table 9. With these coefficients the Fresnel integrals can be computed over the range $0 \leq x \leq \infty$, in general, to eight decimal points. The subroutine used in evaluating the Fresnel integral was checked with the tables of Pearcy[15] and those of Wijngaarden and Scheen[16]. The former tables, using definition (26), are accurate to six or seven digits depending on the size of the argument, while the latter, using definition (25), are accurate to five digits.

(2.) Evaluation of G_b by Gaussian quadrature

With a procedure for evaluating the Fresnel integral, the remaining problem was to compute the integral in (19). The method used, Gaussian quadrature, is described briefly below[17].

In quadrature methods a definite integral is approximated by a weighted sum of particular values of the ordinate with the abscissas properly distributed in the limits of integration. Thus,

$$\int_a^b f(x)\,dx = \sum_{j=1}^{n} H_j\, f(a_j) + E_n \quad . \tag{29}$$

The abscissas a_j are roots of the Legendre polynomials, the weights H_j are functions of these roots, and E_n is the error term which can, in general, be made arbitrarily small with increasing n. The Gaussian roots and weights are tabulated for various n for limits between -1 and 1 by Davis and Rabinowitz[18], but other limits can be used by a change of variable as follows:

$$\int_a^b f(x)\,dx = \frac{b-a}{2}\int_{-1}^{1} g(y)\,dy \quad ,$$

where $$x = \frac{b-a}{2}\,y + \frac{b+a}{2} \quad . \tag{30}$$

Furthermore, in the Gaussian quadrature procedure, the integrand is approximated by a polynomial of $(2n-1)$ degree which has the same ordinates as the function for n discrete abscissas.

To obtain accuracy for G_b equation (19) was written

$$G_b = \frac{i}{\sqrt{2}\pi\cos^{3/2}\psi_o}\left[\int_5^{10}\frac{e^{-ix(1-\cos\psi_o)}F(x)}{\sqrt{x}}\,dx + \int_{10}^{15}\frac{e^{-ix(1-\cos\psi_o)}F(x)}{\sqrt{x}}\,dx \ldots + \int_{kb-5}^{kb}\frac{e^{-ix(1-\cos\psi_o)}F(x)}{\sqrt{x}}\,dx\right] \tag{31}$$

and Gaussian quadrature was used with $n = 16$ in equation (29) for each interval of 5 for kb. This work was checked against (21) for $\psi_o = 0$ and various values of Δ_1 and Δ_2. The answers agreed to the five digits asked for in the results.

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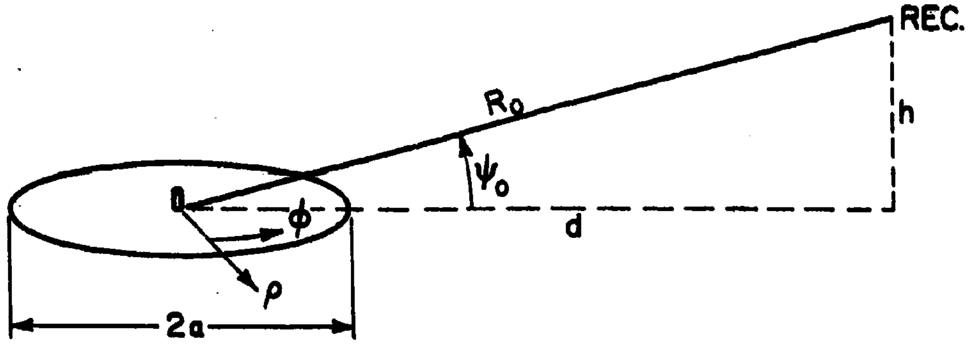


Fig. 1 - Vertical electric dipole located over a circular metal screen which, itself, is lying on a homogeneous ground.

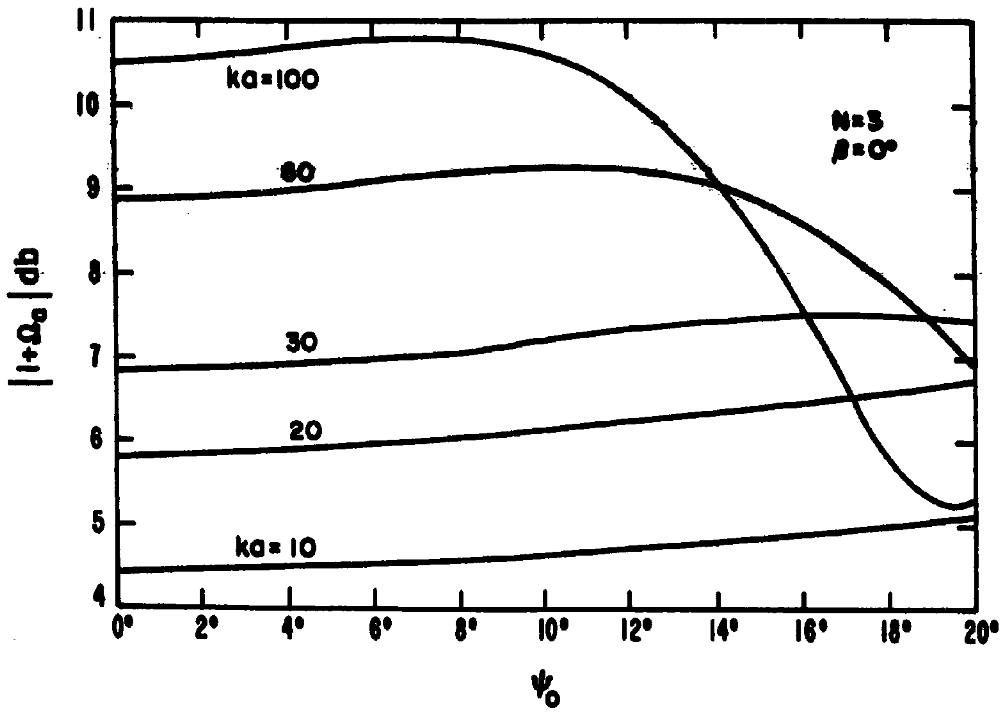


Fig. 2a The amplitude of $1+\Omega_a$ as a function of ψ_o with parameter ka for nonconducting ground illustrating the effect of the circular screen of radius a. [The ordinate can be regarded as the modification of the effective height of the monopole resulting from the presence of the ground screen.]

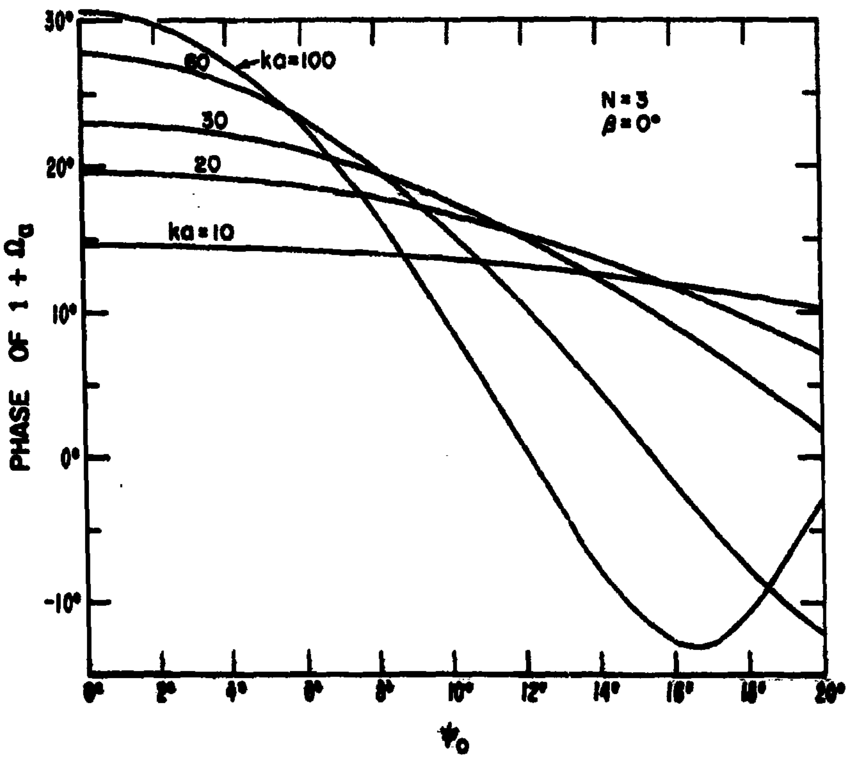


Fig. 2b The phase of $1 + \Omega_a$ as a function of ψ_o with parameter ka for nonconducting ground.

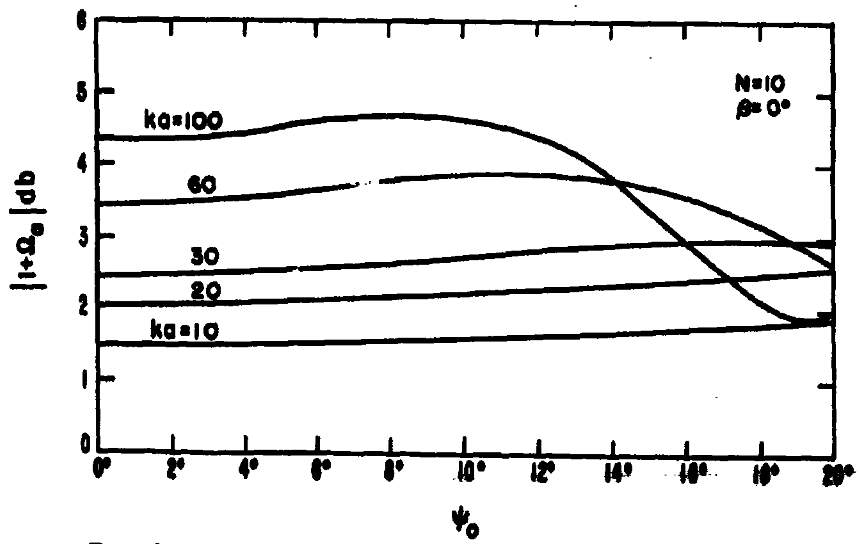


Fig. 3a The amplitude of $1 + \Omega_a$ as a function of ψ_o with parameter ka and nonconducting ground illustrating the effect of large N.

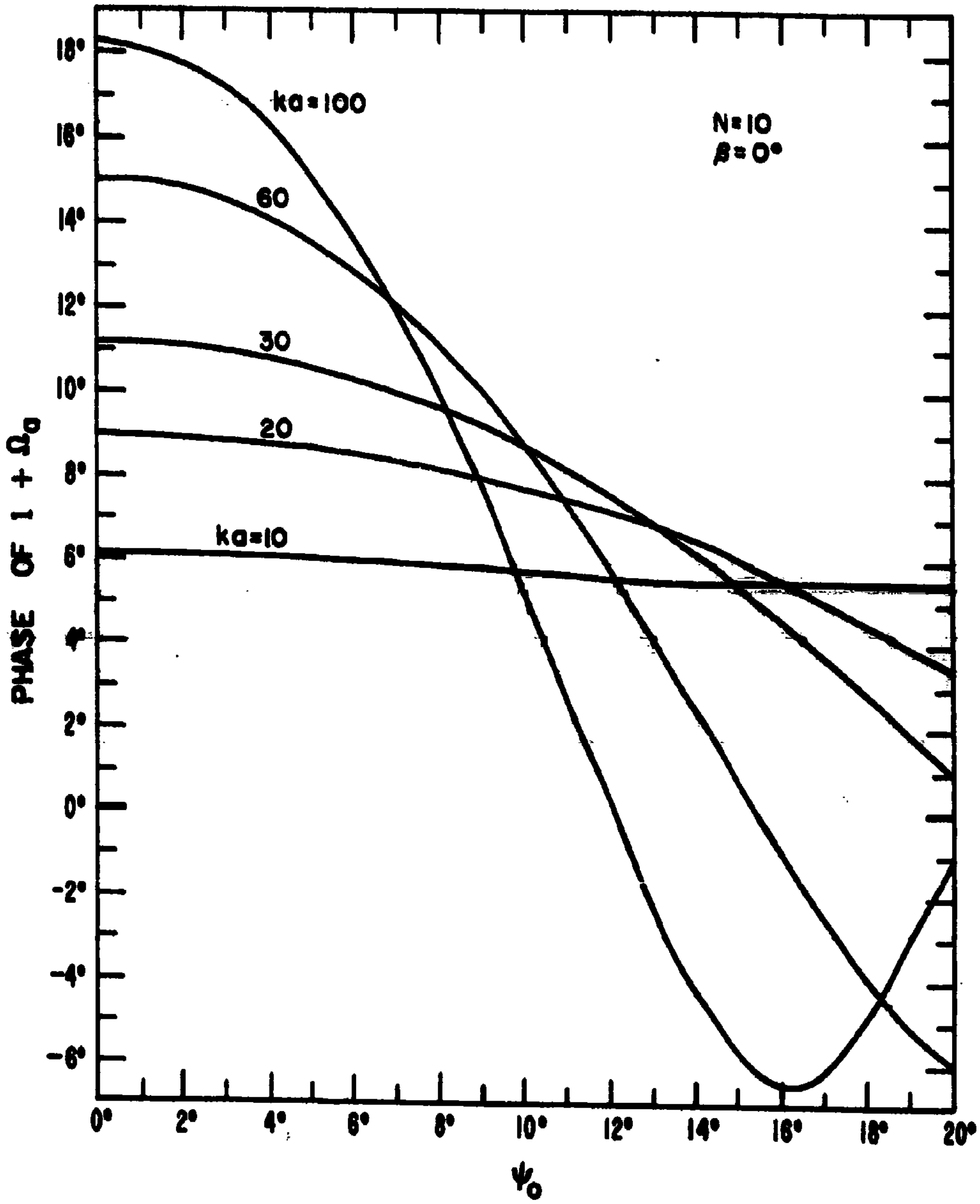


Fig. 3b The phase of $1 + \Omega_a$ as a function of ψ_o with parameter ka and nonconducting ground illustrating the effect of large N.

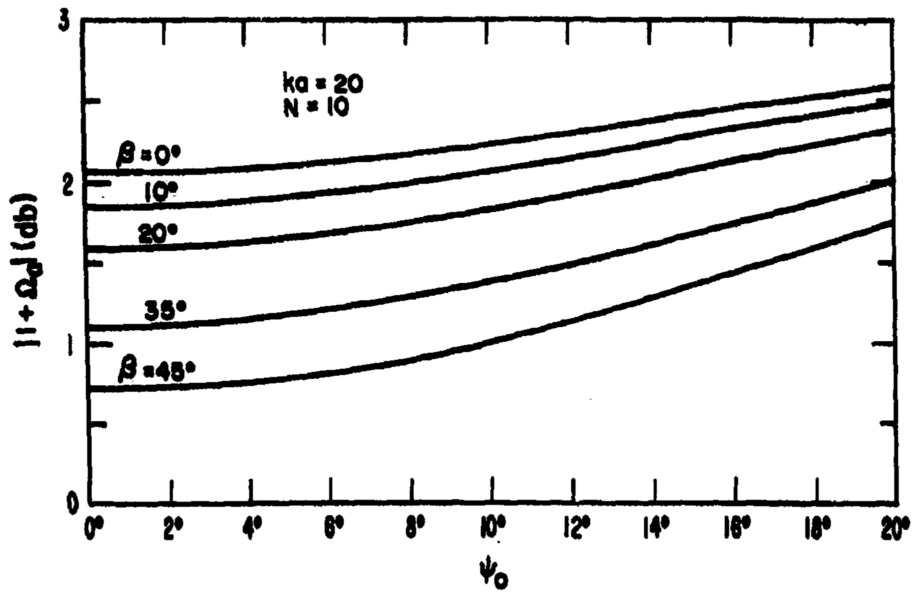


Fig. 4a The amplitude of $1 + \Omega_a$ as a function of ψ_o illustrating the effect of finite β.

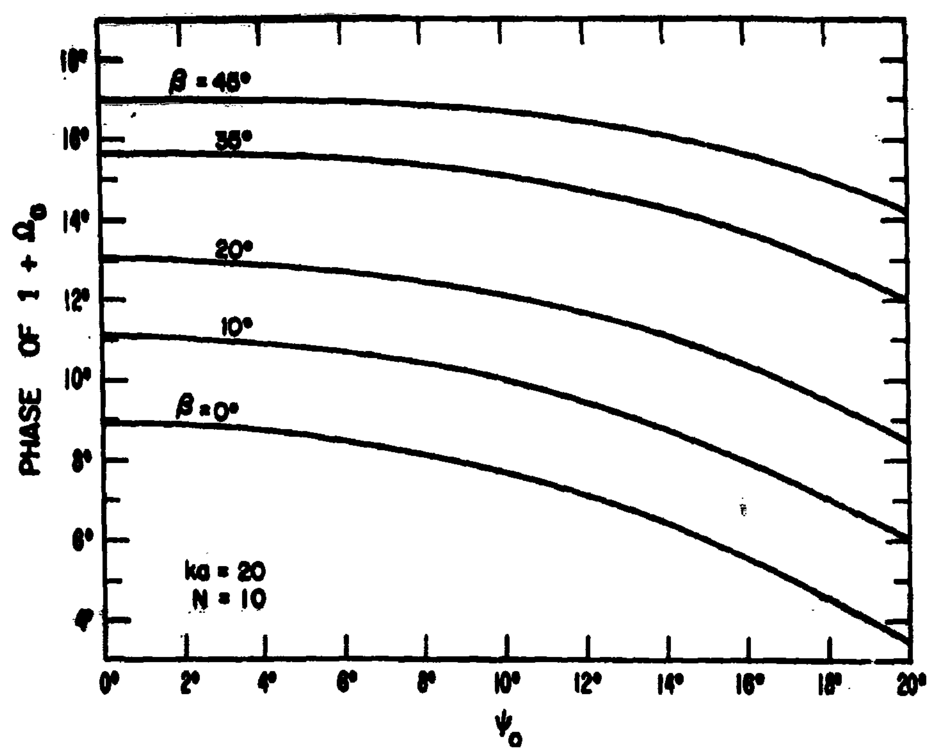


Fig. 4b The phase of $1 + \Omega_a$ as a function of ψ_o illustrating the effect of finite β.

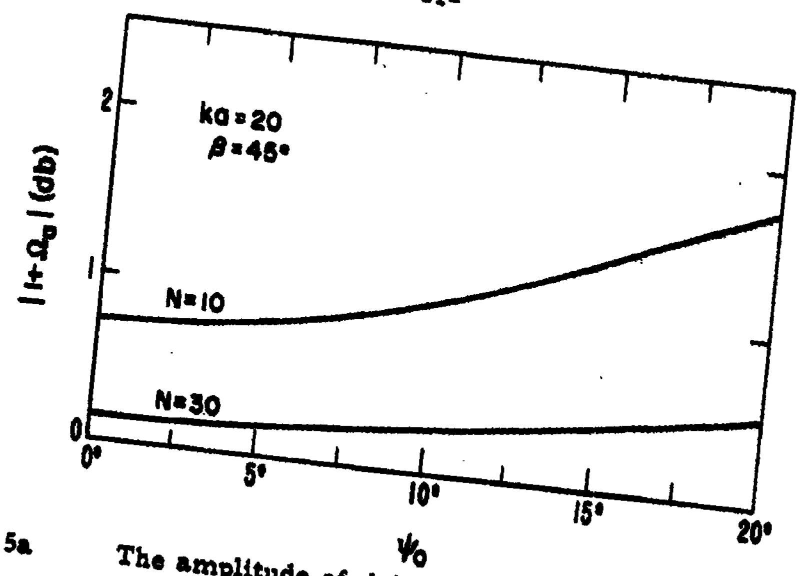


Fig. 5a The amplitude of $1 + \Omega_a$ as a function of ψ_o for highly conducting ground illustrating the effect of large N.

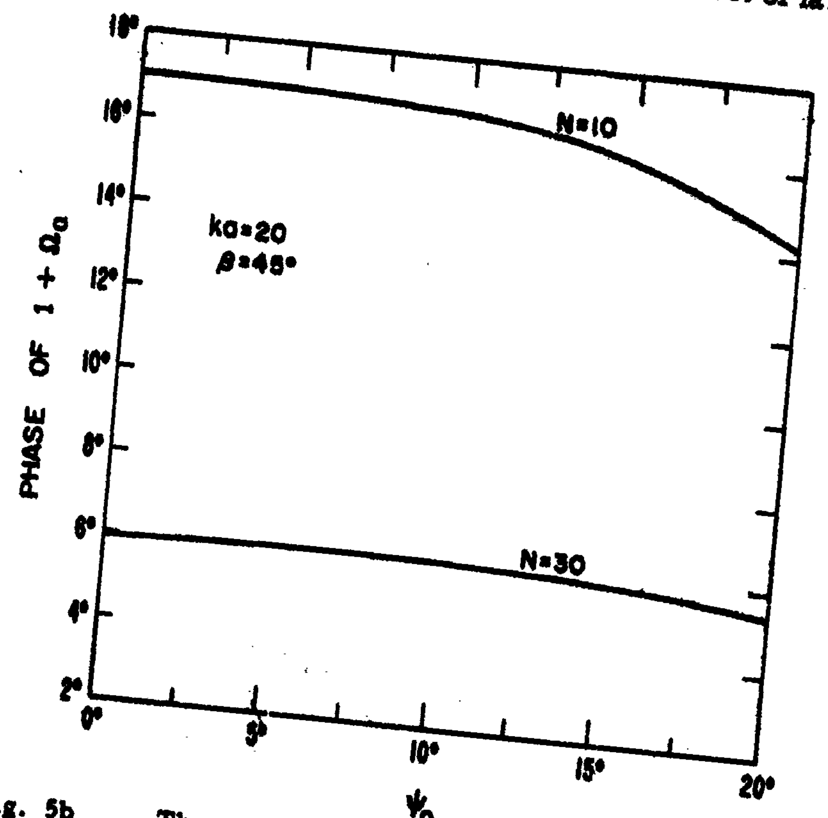


Fig. 5b The phase of $1 + \Omega_a$ as a function of ψ_o for highly conducting ground illustrating the effect of large N.

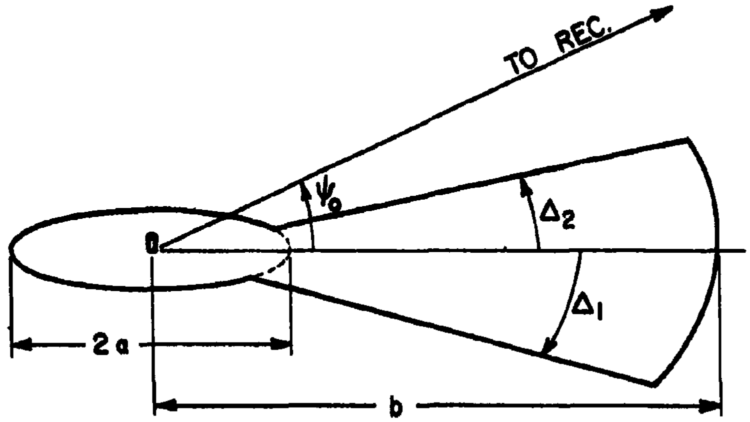


Fig. 6 Vertical electric dipole located over a combination circular-sector screen which, itself, is lying on a homogeneous ground.

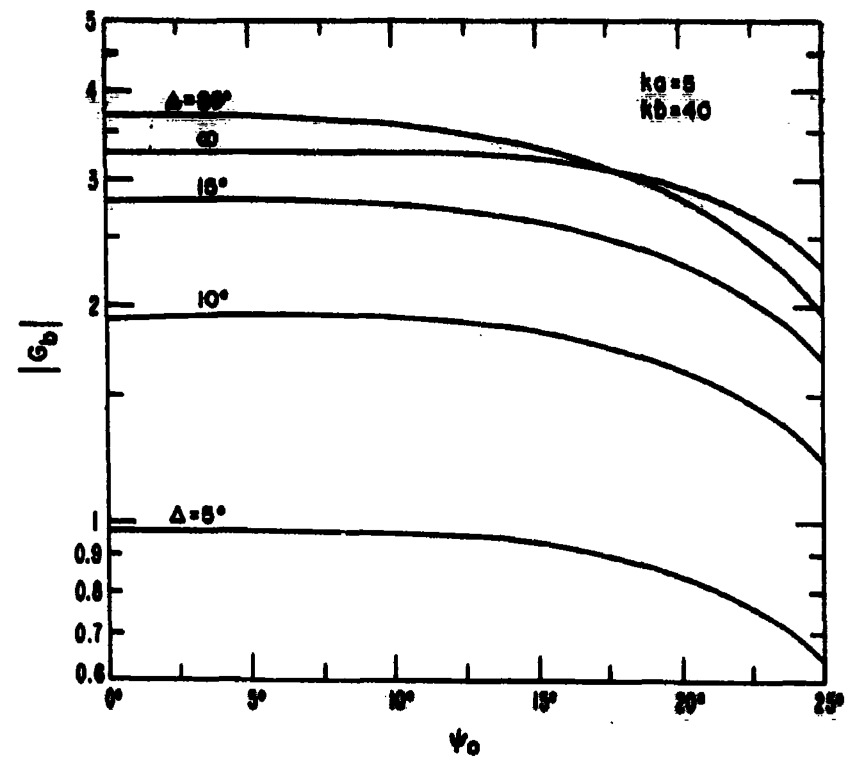


Fig. 7a The amplitude of G_b as a function of ψ_o illustrating the effect of finite Δ. (These curves are for a circular screen of radius a and a sector which extends from a to b)

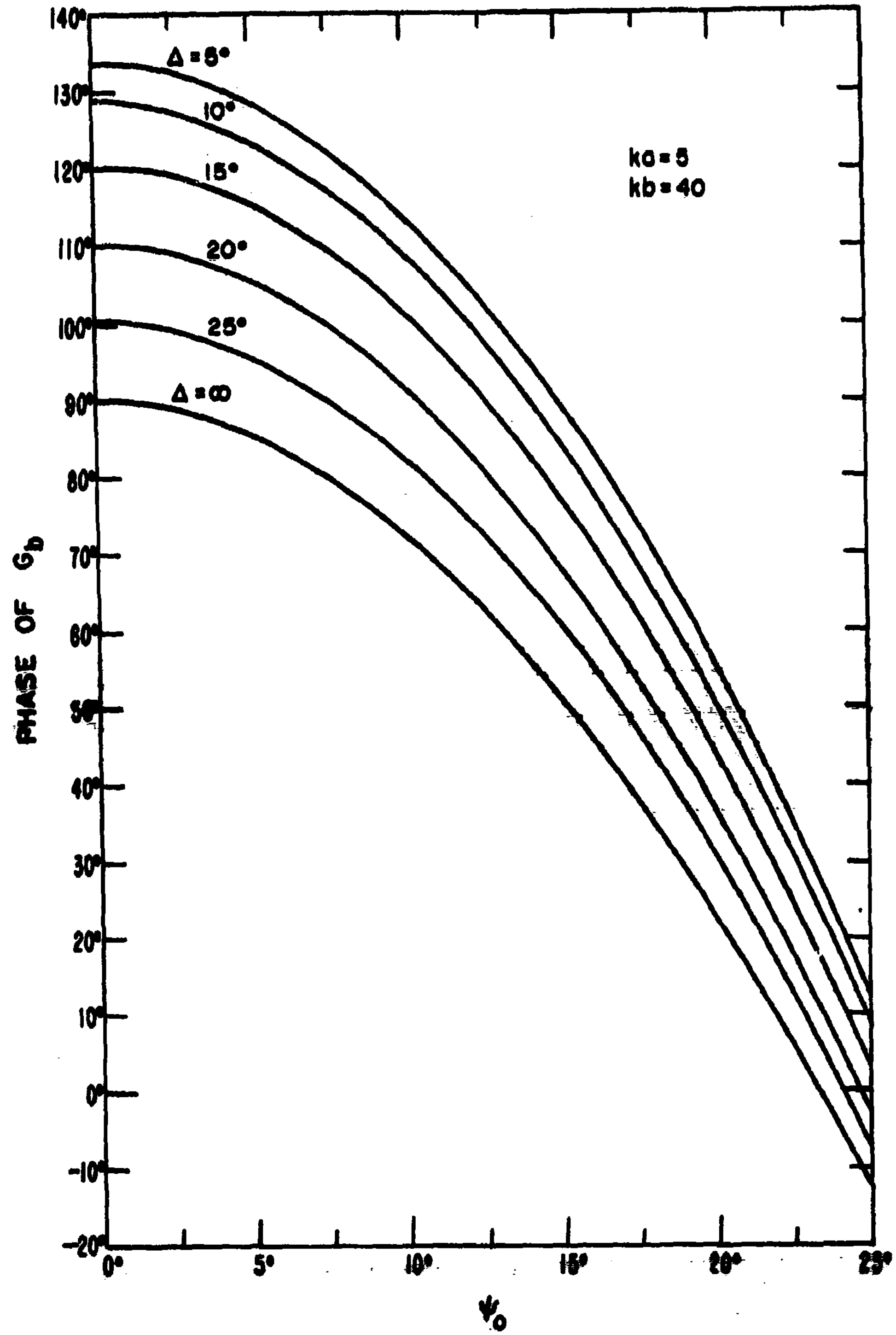


Fig. 7b The phase of G_b as a function of ψ_o illustrating the effect of finite Δ.

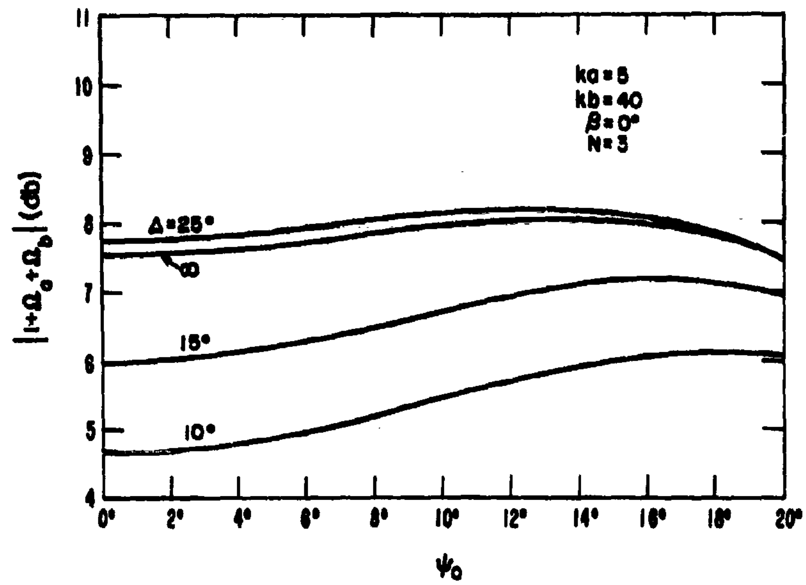


Fig. 8a The amplitude of $1 + \Omega_a + \Omega_b$ as a function of ψ_o illustrating the effect of finite Δ for nonconducting ground. [The ordinate can be regarded as the modification of the effective height of the monopole resulting from the presence of the ground screen which is in the combined form of a circular disc and a sector]

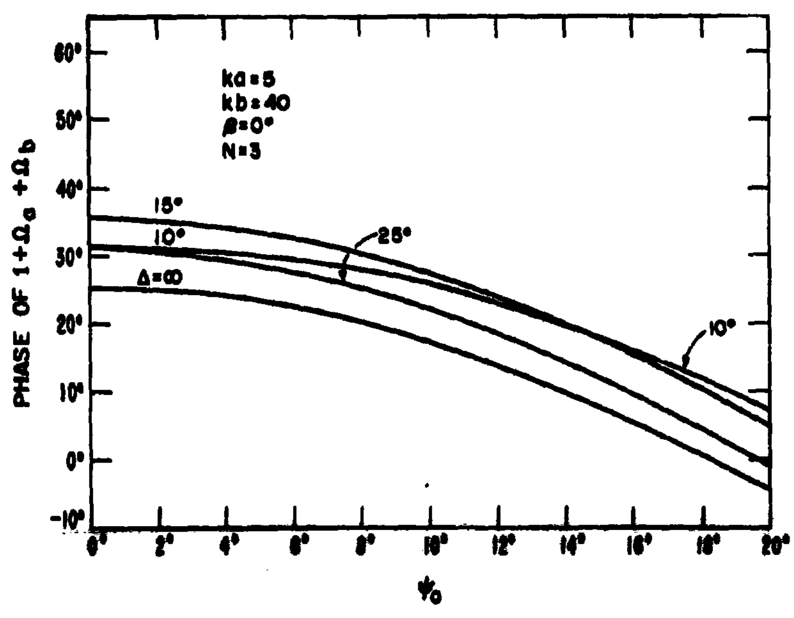


Fig. 8b The phase of $1 + \Omega_a + \Omega_b$ as a function of ψ_o illustrating the effect of finite Δ for nonconducting ground.

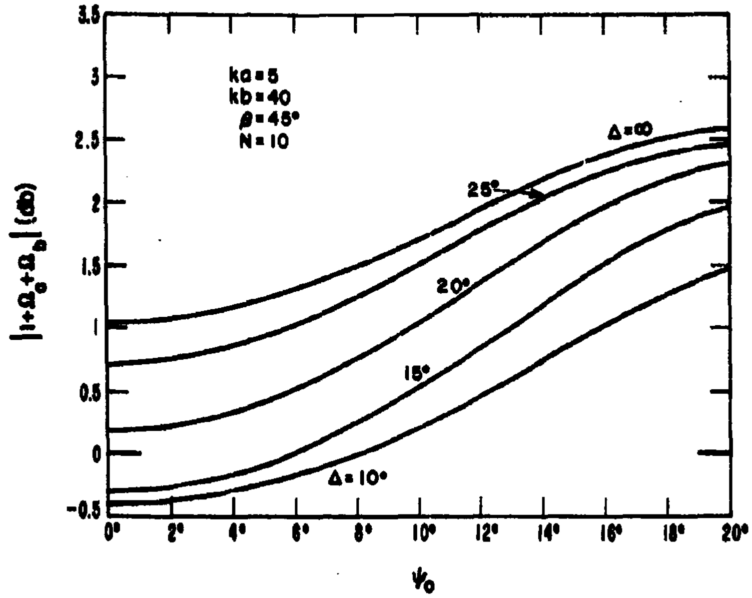


Fig. 9a The amplitude of $1 + \Omega_a + \Omega_b$ as a function of ψ_o for highly conducting ground and large N illustrating the effect of finite Δ.

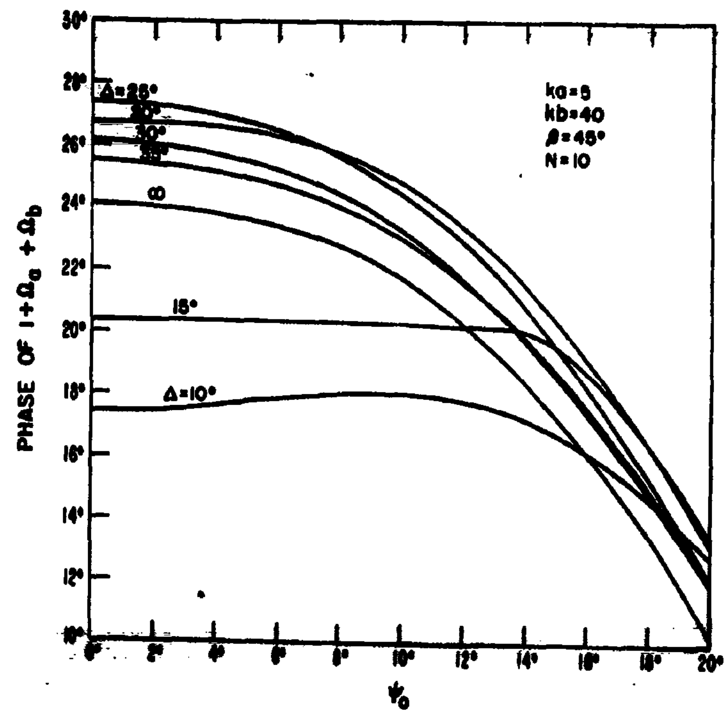


Fig. 9b The phase of $1 + \Omega_a + \Omega_b$ as a function of ψ_o for highly conducting ground and large N illustrating the effect of finite Δ.

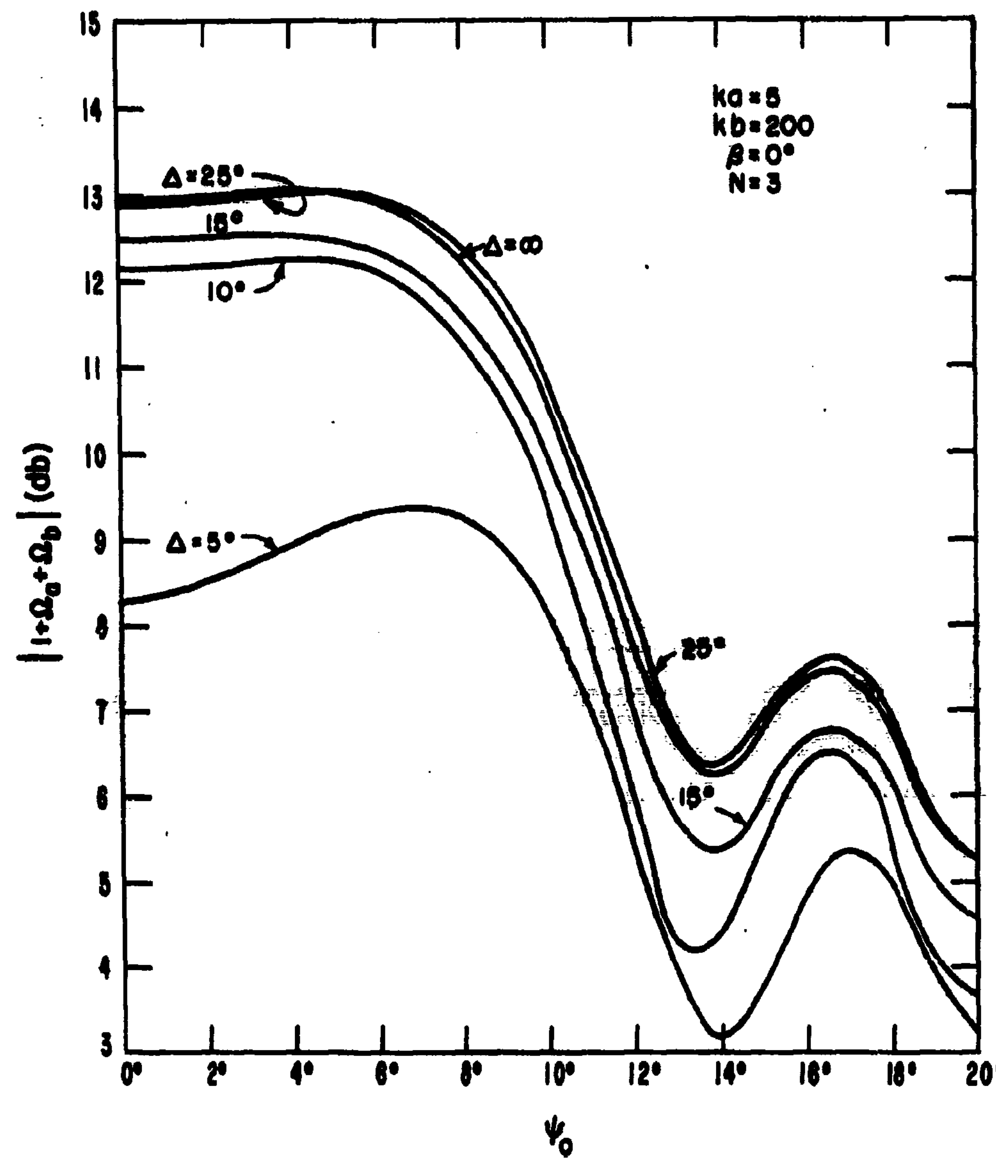
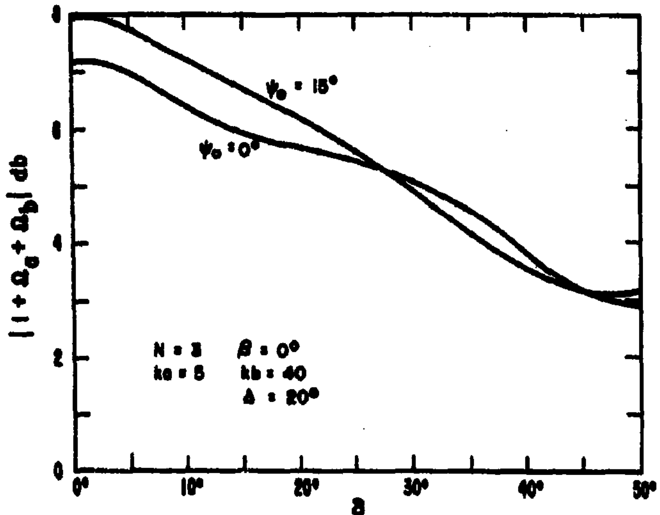
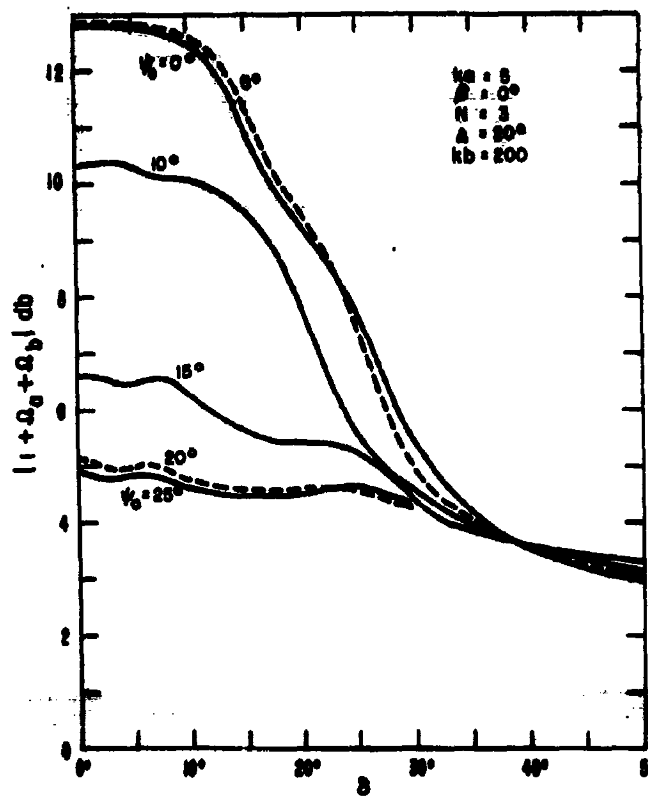


Fig. 10 The amplitude of $1 + \Omega_a + \Omega_b$ as a function of ψ_o illustrating the effect of finite Δ for non-conducting ground.



the azimuthal angle

Fig. 11 The amplitude of $1 + \Omega_a + \Omega_b$ as a function of δ for nonconducting ground illustrating the effect of finite ψ_o for kb = 40



the azimuthal angle

Fig. 12 The amplitude of $1 + \Omega_a + \Omega_b$ as a function of δ for nonconducting ground illustrating the effect of finite ψ_o for kb = 200

Table 1

KA= 5

PSI(DEGREES)	G	PHASE(DEGREES)	G(1)	PHASE(1)(DEGREES)
0	1.3887 +00	7.7144 +01	1.7841 +00	9.0000 +01
1	1.3891 +00	7.7123 +01	1.7845 +00	8.9985 +01
2	1.3902 +00	7.7058 +01	1.7858 +00	8.9942 +01
3	1.3921 +00	7.6951 +01	1.7878 +00	8.9869 +01
4	1.3948 +00	7.6801 +01	1.7907 +00	8.9767 +01
5	1.3983 +00	7.6608 +01	1.7943 +00	8.9637 +01
7	1.4076 +00	7.6092 +01	1.8041 +00	8.9288 +01
10	1.4277 +00	7.4998 +01	1.8251 +00	8.8549 +01
15	1.4790 +00	7.2324 +01	1.8769 +00	8.6747 +01
20	1.5561 +00	6.8612 +01	1.9507 +00	8.4246 +01
25	1.6649 +U0	6.3934 +01	2.0477 +00	8.1070 +01
30	1.8143 +00	5.8423 +01	2.1699 +00	7.7256 +01
35	2.0161 +00	5.2294 +01	2.3201 +00	7.2852 +01
40	2.2849 +00	4.5830 +01	2.5027 +00	6.7927 +01
45	2.6379 +00	3.9340 +01	2.7242 +00	6.2566 +01

KA= 10

PSI(DEGREES)	G	PHASE(DEGREES)	G(1)	PHASE(1)(DEGREES)
0	2.2347 +00	7.9418 +01	2.5231 +00	9.0000 +01
1	2.2355 +00	7.9386 +01	2.5237 +00	8.9971 +01
2	2.2380 +00	7.9292 +01	2.5254 +00	8.9884 +01
3	2.2420 +00	7.9136 +01	2.5283 +00	8.9738 +01
4	2.2477 +00	7.8917 +01	2.5323 +00	8.9535 +01
5	2.2550 +00	7.8637 +01	2.5374 +00	8.9273 +01
7	2.2743 +00	7.7092 +01	2.5510 +00	8.8576 +01
10	2.3148 +00	7.6322 +01	2.5791 +00	8.7099 +U1
15	2.4102 +00	7.2551 +01	2.6441 +U0	8.3499 +01
20	2.5325 +00	6.7426 +01	2.7254 +00	7.8518 +01
25	2.6670 +00	6.1034 +01	2.8118 +00	7.2242 +01
30	2.7920 +00	5.3391 +01	2.8880 +00	6.4819 +01
35	2.8846 +00	4.4417 +01	2.9340 +00	5.6499 +01
40	2.9320 +00	3.4006 +01	2.9260 +00	4.7700 +01
45	2.9472 +00	2.2358 +01	2.8406 +00	3.9159 +01

KA= 20

PSI(DEGREES)	G	PHASE(DEGREES)	G(1)	PHASE(1)(DEGREES)
0	3.2088 +00	8.3070 +01	3.5682 +00	9.0000 +01
1	3.2101 +00	8.3004 +01	3.5691 +00	8.9942 +01
2	3.2139 +00	8.2807 +01	3.5715 +00	8.9767 +01
3	3.2202 +00	8.2478 +01	3.5755 +00	8.9477 +01
4	~~3.2284 +00~~	~~8.2018 +01~~	~~3.5804 +00~~	~~8.9070 +01~~
5	3.2400 +00	8.1428 +01	3.5878 +00	8.8547 +01
7	3.2690 +00	7.9862 +01	3.6050 +00	8.7153 +01
10	3.3269 +00	7.6572 +01	3.6362 +00	8.4202 +01
15	3.4450 +00	6.8737 +01	3.6817 +00	7.7036 +01
20	3.5403 +00	5.8358 +01	3.6697 +00	6.7258 +01
25	3.5192 +00	4.5993 +01	3.5298 +00	5.5374 +01
30	3.2728 +00	3.2262 +01	3.1724 +00	4.2577 +01
35	2.7678 +00	1.8491 +01	2.5782 +00	3.1891 +01
40	2.1566 +00	9.9872 +00	1.8936 +00	3.1532 +01
45	1.8859 +00	1.8111 +01	1.7183 +00	4.9660 +01

KA= 30

PSI(DEGREES)	G	PHASE(DEGREES)	G(1)	PHASE(1)(DEGREES)
0	3.9966 +00	8.5080 +01	4.3702 +00	9.0000 +01
1	3.9980 +00	8.4983 +01	4.3712 +00	8.9913 +01
2	4.0023 +00	8.4690 +01	4.3741 +00	8.9651 +01
3	4.0093 +00	8.4202 +01	4.3789 +00	8.9215 +01
4	4.0188 +00	8.3519 +01	4.3852 +00	8.8604 +01
5	4.0308 +00	8.2642 +01	4.3927 +00	8.7820 +01
7	4.0604 +00	8.0308 +01	4.4097 +00	8.5731 +01
10	4.1127 +00	7.5377 +01	4.4306 +00	8.1311 +01
15	4.1757 +00	6.3599 +01	4.3932 +00	7.0654 +01
20	4.0867 +00	4.8249 +01	4.1355 +00	5.6486 +01
25	3.6387 +00	3.1535 +01	3.5046 +00	4.0737 +01
30	2.7230 +00	1.7663 +01	2.4964 +00	2.9776 +01
35	1.8352 +00	2.0147 +01	1.7175 +00	4.2202 +01
40	2.1422 +00	3.4366 +01	2.1749 +00	5.7104 +01
45	2.8481 +00	2.5315 +01	2.6110 +00	4.4159 +01

KA=100

PSI(DEGREES)	G	PHASE(DEGREES)	G(1)	PHASE(1)(DEGREES)
0	7.6424 +00	8.7479 +01	7.9788 +00	9.0000 +01
1	7.6455 +00	8.7177 +01	7.9806 +00	8.9709 +01
2	7.6541 +00	8.6269 +01	7.9848 +00	8.8837 +01
3	7.6652 +00	8.4757 +01	7.9886 +00	8.7363 +01
4	7.6741 +00	8.2639 +01	7.9810 +00	8.5350 +01
5	7.6749 +00	7.9919 +01	7.9731 +00	8.2741 +01
7	7.6137 +00	7.2692 +01	7.8714 +00	7.5832 +01
10	7.2068 +00	5.7679 +01	7.3572 +00	6.1585 +01
15	4.9918 +00	2.7524 +01	4.8443 +00	3.3696 +01
20	2.5271 +00	4.0004 +01	2.5377 +00	5.2124 +01
25	3.2011 +00	2.8208 +01	3.0747 +00	3.9259 +01
30	2.3910 +00	3.8703 +01	2.4284 +00	5.3722 +01
35	2.0752 +00	2.5785 +01	1.9458 +00	4.4941 +01
40	2.2496 +00	1.9230 +01	2.0482 +00	3.9115 +01
45	2.4683 +00	1.7372 +01	2.1607 +00	3.9056 +01

Table 2

KA=5
DELTA(DEGREES)= 5

KB	PSI(DEGREES) = 0 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 0.5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 1 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 2 G(B)	PHASE(DEGREES)
10	1.3888 -01	1.3445 +02	1.3889 -01	1.3444 +02	1.3890 -01	1.3439 +02	1.3897 -01	1.3419 +02
15	2.7776 -01	1.3427 +02	2.7777 -01	1.3425 +02	2.7780 -01	1.3419 +02	2.7792 -01	1.3392 +02
20	4.1661 -01	1.3409 +02	4.1663 -01	1.3406 +02	4.1668 -01	1.3398 +02	4.1686 -01	1.3366 +02
25	5.5545 -01	1.3391 +02	5.5547 -01	1.3388 +02	5.5553 -01	1.3378 +02	5.5577 -01	1.3339 +02
30	6.9425 -01	1.3373 +02	6.9428 -01	1.3369 +02	6.9435 -01	1.3358 +02	6.9464 -01	1.3312 +02
35	8.3303 -01	1.3355 +02	8.3306 -01	1.3350 +02	8.3314 -01	1.3337 +02	8.3348 -01	1.3285 +02
40	9.7176 -01	1.3336 +02	9.7179 -01	1.3332 +02	9.7189 -01	1.3317 +02	9.7226 -01	1.3258 +02
45	1.1104 +00	1.3318 +02	1.1105 +00	1.3313 +02	1.1106 +00	1.3296 +02	1.1110 +00	1.3231 +02
50	1.2491 +00	1.3300 +02	1.2491 +00	1.3294 +02	1.2492 +00	1.3276 +02	1.2496 +00	1.3204 +02
55	1.3877 +00	1.3282 +02	1.3877 +00	1.3275 +02	1.3878 +00	1.3256 +02	1.3882 +00	1.3177 +02
60	1.5262 +00	1.3264 +02	1.5262 +00	1.3257 +02	1.5263 +00	1.3235 +02	1.5267 +00	1.3151 +02
65	1.6646 +00	1.3246 +02	1.6647 +00	1.3238 +02	1.6648 +00	1.3215 +02	1.6652 +00	1.3124 +02
70	1.8030 +00	1.3227 +02	1.8030 +00	1.3219 +02	1.8031 +00	1.3195 +02	1.8035 +00	1.3097 +02
75	1.9413 +00	1.3209 +02	1.9413 +00	1.3201 +02	1.9414 +00	1.3175 +02	1.9417 +00	1.3070 +02
80	2.0795 +00	1.3191 +02	2.0795 +00	1.3182 +02	2.0796 +00	1.3154 +02	2.0799 +00	1.3043 +02
85	2.2176 +00	1.3173 +02	2.2176 +00	1.3163 +02	2.2177 +00	1.3134 +02	2.2178 +00	1.3016 +02
90	2.3556 +00	1.3155 +02	2.3556 +00	1.3145 +02	2.3557 +00	1.3114 +02	2.3557 +00	1.2990 +02
95	2.4935 +00	1.3137 +02	2.4936 +00	1.3126 +02	2.4936 +00	1.3093 +02	2.4935 +00	1.2963 +02
100	2.6313 +00	1.31[illegible] +02	2.6313 +00	1.3107 +02	2.6313 +00	1.3073 +02	2.6311 +00	1.2936 +02

KB	PSI(DEGREES) = 3 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 4 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 7 G(B)	PHASE(DEGREES)
10	1.3907 -01	1.3387 +02	1.3922 -01	1.3341 +02	1.3941 -01	1.3282 +02	1.3992 -01	1.3126 +02
15	2.7813 -01	1.3349 +02	2.7842 -01	1.3288 +02	2.7879 -01	1.3210 +02	2.7976 -01	1.3001 +02
20	4.1716 -01	1.3311 +02	4.1758 -01	1.3235 +02	4.1811 -01	1.3137 +02	4.1945 -01	1.2876 +02
25	5.5616 -01	1.3273 +02	5.5669 -01	1.3182 +02	5.5735 -01	1.3064 +02	5.5895 -01	1.2751 +02
30	6.9531 -01	1.3236 +02	6.9573 -01	1.3129 +02	6.9647 -01	1.2992 +02	6.9812 -01	1.2626 +02
35	8.3400 -01	1.3198 +02	8.3468 -01	1.3076 +02	8.3546 -01	1.2919 +02	8.3695 -01	1.2502 +02
40	9.7283 -01	1.3160 +02	9.7351 -01	1.3023 +02	9.7428 -01	1.2847 +02	9.7536 -01	1.2377 +02
45	1.1116 +00	1.3122 +02	1.1121 +00	1.2970 +02	1.1129 +00	1.2774 +02	1.1133 +00	1.2252 +02
50	1.2502 +00	1.3084 +02	1.2509 +00	1.2917 +02	1.2515 +00	1.2701 +02	1.2506 +00	1.2127 +02
55	1.3888 +00	1.3047 +02	1.3893 +00	1.2864 +02	1.3895 +00	1.2629 +02	1.3873 +00	1.2003 +02
60	1.5272 +00	1.3009 +02	1.5276 +00	1.2811 +02	1.5274 +00	1.2556 +02	1.5233 +00	1.1878 +02
65	1.6656 +00	1.2971 +02	1.6657 +00	1.2758 +02	1.6650 +00	1.2484 +02	1.6585 +00	1.1753 +02
70	1.8038 +00	1.2934 +02	1.8036 +00	1.2705 +02	1.8022 +00	1.2411 +02	1.7929 +00	1.1629 +02
75	1.9418 +00	1.2896 +02	1.9412 +00	1.2652 +02	1.9392 +00	1.2339 +02	1.9264 +00	1.1504 +02
80	2.0798 +00	1.2858 +02	2.0787 +00	1.2599 +02	2.0757 +00	1.2266 +02	2.0589 +00	1.1380 +02
85	2.2175 +00	1.2820 +02	2.2159 +00	1.2546 +02	2.2118 +00	1.2194 +02	2.1901 +00	1.1255 +02
90	2.3551 +00	1.2783 +02	2.3528 +00	1.2493 +02	2.3476 +00	1.2121 +02	2.3207 +00	1.1131 +02
95	2.4925 +00	1.2745 +02	2.4895 +00	1.2441 +02	2.4828 +00	1.2049 +02	2.4498 +00	1.1006 +02
100	2.6297 +00	1.2707 +02	2.6258 +00	1.2388 +02	2.6176 +00	1.1977 +02	2.5778 +00	1.0882 +02

KB	PSI(DEGREES) = 10 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 12 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 14 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 15 G(B)	PHASE(DEGREES)
10	1.4099 -01	1.2791 +02	1.4191 -01	1.2508 +02	1.4299 -01	1.2171 +02	1.4360 -01	1.1983 +02
15	2.8175 -01	1.2558 +02	2.8333 -01	1.2177 +02	2.8512 -01	1.1728 +02	2.8607 -01	1.1477 +02
20	4.2198 -01	1.2322 +02	4.2380 -01	1.1846 +02	4.2553 -01	1.1284 +02	4.2630 -01	1.0972 +02
25	5.6150 -01	1.2087 +02	5.6286 -01	1.1515 +02	5.6339 -01	1.0841 +02	5.6320 -01	1.0466 +02
30	7.0005 -01	1.1851 +02	6.9999 -01	1.1185 +02	6.9785 -01	1.0398 +02	6.9569 -01	9.9608 +01
35	8.3739 -01	1.1616 +02	8.3477 -01	1.0854 +02	8.2812 -01	9.9554 +01	8.2274 -01	9.4553 +01
40	9.7379 -01	1.1381 +02	9.6674 -01	1.0523 +02	9.5340 -01	9.5126 +01	9.4337 -01	8.9498 +01
45	1.1075 +00	1.1145 +02	1.0955 +00	1.0193 +02	1.0730 +00	9.0695 +01	1.0566 +00	8.4445 +01
50	1.2396 +00	1.0910 +02	1.2205 +00	9.8620 +01	1.1861 +00	8.6267 +01	1.1616 +00	7.9392 +01
55	1.3700 +00	1.0675 +02	1.3416 +00	9.5315 +01	1.2921 +00	8.1840 +01	1.2576 +00	7.4340 +01
60	1.4978 +00	1.0439 +02	1.4579 +00	9.2011 +01	1.3903 +00	7.7411 +01	1.3437 +00	6.9289 +01
65	1.6230 +00	1.0204 +02	1.5694 +00	8.8707 +01	1.4802 +00	7.2987 +01	1.4193 +00	6.4239 +01
70	1.7455 +00	9.9689 +01	1.6756 +00	8.5404 +01	1.5612 +00	6.8563 +01	1.4839 +00	5.9190 +01
75	1.8649 +00	9.7338 +01	1.7762 +00	8.2101 +01	1.6328 +00	6.4139 +01	1.5368 +00	5.4143 +01
80	1.9812 +00	9.4987 +01	1.8709 +00	7.8800 +01	1.6947 +00	5.9717 +01	1.5778 +00	4.9098 +01
85	2.0940 +00	9.2637 +01	1.9593 +00	7.5500 +01	1.7464 +00	5.5297 +01	1.6066 +00	4.4054 +01
90	2.2031 +00	9.0288 +01	2.0411 +00	7.2200 +01	1.7876 +00	5.0878 +01	1.6228 +00	3.9013 +01
95	2.3087 +00	8.7940 +01	2.1161 +00	6.8902 +01	1.8181 +00	4.6461 +01	1.6263 +00	3.3976 +01
100	2.4102 +00	8.5592 +01	2.1839 +00	6.5605 +01	1.8378 +00	4.2046 +01	1.6172 +00	2.8938 +01

KB	PSI(DEGREES) = 16 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 17 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 18 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 18.5 G(B)	PHASE(DEGREES)
10	1.4426 -01	1.1781 +02	1.4493 -01	1.1570 +02	1.4565 -01	1.1365 +02	1.4603 -01	1.1228 +02
15	2.8703 -01	1.1211 +02	2.8807 -01	1.0927 +02	2.8900 -01	1.0627 +02	2.8950 -01	1.0470 +02
20	4.2695 -01	1.0638 +02	4.2767 -01	1.0284 +02	4.2781 -01	9.9081 +01	4.2790 -01	9.7178 +01
25	5.6260 -01	1.0066 +02	5.6152 -01	9.6405 +01	5.5988 -01	9.1900 +01	5.5882 -01	8.9555 +01
30	6.9242 -01	9.4937 +01	6.8849 -01	8.9974 +01	6.8315 -01	8.4718 +01	6.7997 -01	8.1982 +01
35	8.1571 -01	8.9215 +01	8.0676 -01	8.3563 +01	7.9567 -01	7.7537 +01	7.8926 -01	7.4410 +01
40	9.3066 -01	8.3494 +01	9.1485 -01	7.7115 +01	8.9568 -01	7.0356 +01	8.8673 -01	6.6838 +01
45	1.0363 +00	7.7774 +01	1.0114 +00	7.0685 +01	9.8160 -01	6.3177 +01	9.6672 -01	5.9268 +01
50	1.1315 +00	7.2054 +01	1.0952 +00	6.4255 +01	1.0521 +00	5.5998 +01	1.0279 +00	5.1699 +01
55	1.2155 +00	6.6335 +01	1.1652 +00	5.7828 +01	1.1061 +00	4.8821 +01	1.0731 +00	4.4131 +01
60	1.2873 +00	6.0618 +01	1.2205 +00	5.1403 +01	1.1426 +00	4.1646 +01	1.0996 +00	3.6566 +01
65	1.3461 +00	5.4902 +01	1.2606 +00	4.4979 +01	1.1613 +00	3.4473 +01	1.1068 +00	2.9002 +01
70	1.3918 +00	4.9187 +01	1.2846 +00	3.8557 +01	1.1617 +00	2.7302 +01	1.0948 +00	2.1442 +01
75	1.4234 +00	4.3475 +01	1.2922 +00	3.2137 +01	1.1439 +00	2.0135 +01	1.0637 +00	1.3886 +01
80	1.4408 +00	3.7764 +01	1.2818 +00	2.5720 +01	1.1081 +00	1.2971 +01	1.0140 +00	6.3318 +00
85	1.4439 +00	3.2756 +01	1.2592 +00	1.9307 +01	1.0550 +00	5.8128 +00	9.4664 -01	-1.2115 +00
90	1.4325 +00	2.6551 +01	1.2188 +00	1.2898 +01	9.8528 -01	-1.3587 +00	8.6281 -01	-8.7476 +00
95	1.4069 +00	2.0650 +01	1.1631 +00	6.4948 +00	9.0018 -01	-8.4806 +00	7.6398 -01	-1.6270 +01
100	1.3673 +00	1.4953 +01	1.0927 +00	9.8482 -02	8.0101 -01	-1.5609 +01	6.5188 -01	-2.3772 +01

KB	PSI(DEGREES) = 19 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 19.5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 20 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 20.5 G(B)	PHASE(DEGREES)
10	1.4541 -01	1.1137 +02	1.4681 -01	1.0984 +02	1.4722 -01	1.0851 +02	1.4763 -01	1.0728 +02
15	2.8990 -01	1.0310 +02	2.9047 -01	1.0145 +02	2.9095 -01	9.9765 +01	2.9142 -01	9.8035 +01
20	4.2703 -01	9.5122 +01	4.2791 -01	9.3064 +01	4.2781 -01	9.0555 +01	4.2766 -01	8.8796 +01
25	5.5750 -01	8.7141 +01	5.5617 -01	8.4678 +01	5.5456 -01	8.2147 +01	5.5276 -01	7.9554 +01
30	6.7644 -01	7.9171 +01	6.7253 -01	7.6292 +01	6.6821 -01	7.3359 +01	6.6367 -01	7.0515 +01
35	7.8218 -01	7.1200 +01	7.7467 -01	6.7907 +01	7.6608 -01	6.4535 +01	7.5697 -01	6.1076 +01
40	8.7278 -01	6.3727 +01	8.5984 -01	5.9523 +01	8.4585 -01	5.5727 +01	8.3080 -01	5.1859 +01
45	9.4647 -01	5.5256 +01	9.2679 -01	5.1141 +01	9.0566 -01	4.6923 +01	8.8304 -01	4.2603 +01
50	1.0018 +00	4.7286 +01	9.7390 -01	4.2759 +01	9.4408 -01	3.8123 +01	9.1236 -01	3.3368 +01
55	1.0378 +00	3.9317 +01	1.0002 +00	3.4380 +01	9.6025 -01	2.9320 +01	9.1799 -01	2.4136 +01
60	1.0537 +00	3.1351 +01	1.0050 +00	2.6303 +01	9.5172 -01	2.0522 +01	[illegible].4919 -01	1.4908 +01
65	1.0492 +00	2.3388 +01	9.8842 -01	1.7629 +01	9.2472 -01	1.1727 +01	8.5825 -01	5.6028 +00
70	1.0244 +00	1.5428 +01	9.5067 -01	9.2596 +00	8.7392 -01	2.9379 +00	7.9444 -01	-3.5351 +00
75	9.7979 -01	7.4721 +00	8.9260 -01	8.9693 -01	8.0252 -01	-5.8469 +00	7.1005 -01	-1.2746 +01
80	9.1626 -01	-4.7760 -01	8.1547 -01	-7.4619 +00	7.1323 -01	-1.4618 +01	6.0726 -01	-2.1963 +01
85	8.3304 -01	-8.4188 +00	7.2093 -01	-1.5807 +01	6.0518 -01	-2.3374 +01	4.8877 -01	-3.1113 +01
90	7.3772 -01	-1.6367 +01	6.1103 -01	-2.4134 +01	4.8391 -01	-3.2100 +01	3.5764 -01	-4.0229 +01
95	6.2617 -01	-2.4255 +01	4.8811 -01	-3.2426 +01	3.5129 -01	-4.0760 +01	2.1731 -01	-4.9182 +01
100	5.0258 -01	-3.2137 +01	3.5483 -01	-4.0645 +01	2.1047 -01	-4.9720 +01	7.1444 -02	-5.6944 +01

KB	PSI(DEGREES) = 20.75 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 21 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 21.75 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 22 G(B)	PHASE(DEGREES)
10	1.4786 -01	1.0662 +02	1.4806 -01	1.0595 +02	1.4872 -01	1.0390 +02	1.4894 -01	1.0320 +02
15	2.9166 -01	9.7156 +01	2.9185 -01	9.6266 +01	2.9257 -01	9.3556 +01	2.9279 -01	9.2606 +01
20	4.2752 -01	8.7695 +01	4.2739 -01	8.6583 +01	4.2686 -01	8.3170 +01	4.2661 -01	8.2008 +01
25	5.5175 -01	7.8235 +01	5.5070 -01	7.6900 +01	5.4720 -01	7.2806 +01	5.4591 -01	7.1410 +01
30	6.6094 -01	6.8775 +01	6.5830 -01	6.7219 +01	6.4966 -01	6.2442 +01	6.4654 -01	6.0814 +01
35	7.5716 -01	5.9317 +01	7.4712 -01	5.7538 +01	7.3090 -01	5.2018 +01	7.2510 -01	5.0218 +01
40	8.2265 -01	4.9850 +01	8.1465 -01	4.7858 +01	7.8827 -01	4.1717 +01	7.7491 -01	3.9624 +01
45	8.7117 -01	4.0404 +01	8.5893 -01	3.8180 +01	8.1990 -01	3.1357 +01	8.0611 -01	2.9032 +01
50	8.9518 -01	3.0950 +01	8.7873 -01	2.8504 +01	8.2676 -01	2.0999 +01	8.0584 -01	1.8442 +01
55	8.9607 -01	2.1599 +01	8.7350 -01	1.8831 +01	8.0269 -01	1.0645 +01	7.7806 -01	7.8551 +00
60	8.7188 -01	1.2051 +01	8.4337 -01	9.1611 +00	7.5644 -01	2.9460 -01	7.2376 -01	-2.7267 +00
65	8.2406 -01	2.9072 +00	7.8921 -01	-5.0395 -01	6.8158 -01	-1.0049 +01	6.4476 -01	-1.3301 +01
70	7.5380 -01	-6.8300 +00	7.1263 -01	-1.0167 +01	5.8650 -01	-2.0382 +01	5.4380 -01	-2.3863 +01
75	6.6309 -01	-1.6257 +01	6.1775 -01	-1.9808 +01	4.7212 -01	-3.0695 +01	4.2434 -01	-3.4401 +01
80	5.5438 -01	-2.5658 +01	5.0137 -01	-2.9434 +01	3.4277 -01	-4.0985 +01	2.9045 -01	-4.4880 +01
85	4.3064 -01	-3.5045 +01	3.7276 -01	-3.9016 +01	2.0210 -01	-5.1099 +01	1.4672 -01	-5.5122 +01
90	2.9576 -01	-4.4366 +01	2.3360 -01	-4.8475 +01	5.4915 -02	-6.0002 +01	2.6595 -03	7.1299 +01
95	1.5191 -01	-5.3335 +01	8.7867 -02	-5.7395 +01	9.4061 -02	1.0649 +02	1.5051 -01	1.0237 +02
100	[illegible].1376 -03	-[illegible].6565 +01	6.0586 -02	1.0939 +02	2.5903 -01	9.6842 +01	2.9383 -01	9.2033 +01

KB	PSI(DEGREES) = 23 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 24 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 25 G(B)	PHASE(DEGREES)
10	1.4986 -01	1.0034 +02	1.5082 -01	9.7551 +01	1.5181 -01	9.4765 +01
15	2.9361 -01	8.8784 +01	2.9442 -01	8.4801 +01	2.9517 -01	8.0860 +01
20	4.2550 -01	7.7250 +01	4.2394 -01	7.2252 +01	4.2190 -01	6.7075 +01
25	5.4011 -01	6.5679 +01	5.3319 -01	5.9706 +01	5.2506 -01	5.3602 +01
30	6.3781 -01	5.4126 +01	6.1695 -01	4.7157 +01	5.9784 -01	3.9910 +01
35	6.9989 -01	4.2575 +01	6.7122 -01	3.4611 +01	6.3909 -01	2.6329 +01
40	7.3852 -01	3.1026 +01	6.9146 -01	2.2067 +01	6.4358 -01	1.2750 +01
45	7.4728 -01	1.9479 +01	6.8246 -01	9.5255 +00	6.1206 -01	-8.2556 -01
50	7.2571 -01	7.9350 +00	6.3890 -01	-3.0120 +00	5.4650 -01	-1.4396 +01
55	6.7676 -01	-3.6065 +00	5.6484 -01	-1.5543 +01	4.5000 -01	-2.7956 +01
60	5.7648 -01	-1.5137 +01	4.6381 -01	-2.8063 +01	3.2255 -01	-4.1495 +01
65	4.9605 -01	-2.6657 +01	3.4066 -01	-4.0558 +01	1.8875 -01	-5.4963 +01
70	3.7165 -01	-3.8151 +01	2.0127 -01	-5.2974 +01	3.8456 -02	-6.7522 +01
75	2.3424 -01	-4.9572 +01	5.4730 -02	-6.4636 +01	1.1396 -01	9.7391 +01
80	9.7497 -02	-6.0561 +01	9.9076 -02	1.0101 +02	2.5992 -01	8.3847 +01
85	6.2937 -02	1.0576 +02	2.4564 -01	8.8567 +01	3.9128 -01	7.0355 +01
90	2.1065 -01	9.5389 +01	3.8043 -01	7.6402 +01	5.0070 -01	5.6815 +01
95	3.4975 -01	8.3896 +01	4.9700 -01	6.3908 +01	5.8765 -01	4.3266 +01
100	4.7461 -01	7.2218 +01	5.8975 -01	5.1401 +01	6.3081 -01	2.9716 +01

B-36511

Table 3

KA=5
DELTA(DEGREES)=10

KB	PSI(DEGREES) = 0 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 1 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 2 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 3 G(B)	PHASE(DEGREES)
10	2.7760 -01	1.3282 +02	2.7769 -01	1.3275 +02	2.7777 -01	1.3256 +02	2.7798 -01	1.3223 +02
15	5.5488 -01	1.3209 +02	5.5496 -01	1.3201 +02	5.5520 -01	1.3175 +02	5.5560 -01	1.3131 +02
20	8.3163 -01	1.3137 +02	8.3175 -01	1.3128 +02	8.3209 -01	1.3093 +02	8.3265 -01	1.3039 +02
25	1.1077 +00	1.3064 +02	1.1078 +00	1.3051 +02	1.1082 +00	1.3012 +02	1.1089 +00	1.2947 +02
30	1.3828 +00	1.2992 +02	1.3830 +00	1.2977 +02	1.3835 +00	1.2931 +02	1.3841 +00	1.2855 +02
35	1.6569 +00	1.2920 +02	1.6571 +00	1.2903 +02	1.6575 +00	1.2850 +02	1.6583 +00	1.2764 +02
40	1.9298 +00	1.2848 +02	1.9299 +00	1.2828 +02	1.9303 +00	1.2770 +02	1.9309 +00	1.2673 +02
45	2.2012 +00	1.2776 +02	2.2013 +00	1.2755 +02	2.2016 +00	1.2690 +02	2.2019 +00	1.2581 +02
50	2.4710 +00	1.2705 +02	2.4710 +00	1.2681 +02	2.4712 +00	1.2610 +02	2.4712 +00	1.2491 +02
55	2.7390 +00	1.2634 +02	2.7390 +00	1.2608 +02	2.7388 +00	1.2530 +02	2.7384 +00	1.2400 +02
60	3.0050 +00	1.2563 +02	3.0049 +00	1.2535 +02	3.0045 +00	1.2451 +02	3.0034 +00	1.2310 +02
65	3.2690 +00	1.2492 +02	3.2687 +00	1.2462 +02	3.2679 +00	1.2372 +02	3.2660 +00	1.2221 +02
70	3.5306 +00	1.2422 +02	3.5302 +00	1.2390 +02	3.5289 +00	1.2293 +02	3.5260 +00	1.2132 +02
75	3.7899 +00	1.2355 +02	3.7893 +00	1.2318 +02	3.7875 +00	1.2215 +02	3.7833 +00	1.2043 +02
80	4.0465 +00	1.2284 +02	4.0457 +00	1.2247 +02	4.0430 +00	1.2137 +02	4.0374 +00	1.1955 +02
85	4.3004 +00	1.2215 +02	4.2993 +00	1.2176 +02	4.2957 +00	1.2060 +02	4.2888 +00	1.1867 +02
90	4.5513 +00	1.2147 +02	4.5500 +00	1.2106 +02	4.5455 +00	1.1984 +02	4.5368 +00	1.1780 +02
95	4.7993 +00	1.2079 +02	4.7976 +00	1.2036 +02	4.7920 +00	1.1908 +02	4.7813 +00	1.1694 +02
100	5.0441 +00	1.2012 +02	5.0420 +00	1.1967 +02	5.0333 +00	1.1832 +02	5.0223 +00	1.1608 +02

KB	PSI(DEGREES) = 4 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 7 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 10 G(B)	PHASE(DEGREES)
10	2.7827 -01	1.3178 +02	2.7865 -01	1.3119 +02	2.7965 -01	1.2963 +02	2.8178 -01	1.2632 +02
15	5.5616 -01	1.3070 +02	5.5688 -01	1.2992 +02	5.5875 -01	1.2784 +02	5.6256 -01	1.2349 +02
20	8.3343 -01	1.2963 +02	8.3441 -01	1.2866 +02	8.3688 -01	1.2606 +02	8.4149 -01	1.2055 +02
25	1.1098 +00	1.2856 +02	1.1110 +00	1.2739 +02	1.1136 +00	1.2427 +02	1.1177 +00	1.1766 +02
30	1.3851 +00	1.2749 +02	1.3865 +00	1.2613 +02	1.3886 +00	1.2249 +02	1.3904 +00	1.1478 +02
35	1.6591 +00	1.2643 +02	1.6600 +00	1.2487 +02	1.6614 +00	1.2071 +02	1.6588 +00	1.1190 +02
40	1.9315 +00	1.2536 +02	1.9320 +00	1.2361 +02	1.9316 +00	1.1894 +02	1.9220 +00	1.0903 +02
45	2.2022 +00	1.2430 +02	2.2020 +00	1.2235 +02	2.1988 +00	1.1717 +02	2.1793 +00	1.0617 +02
50	2.4708 +00	1.2324 +02	2.4696 +00	1.2110 +02	2.4627 +00	1.1540 +02	2.4299 +00	1.0331 +02
55	2.7372 +00	1.2219 +02	2.7347 +00	1.1986 +02	2.7229 +00	1.1364 +02	2.6731 +00	1.0046 +02
60	3.0011 +00	1.2114 +02	2.9969 +00	1.1862 +02	2.9790 +00	1.1189 +02	2.9083 +00	9.7626 +01
65	3.2624 +00	1.2009 +02	3.2561 +00	1.1738 +02	3.2307 +00	1.1014 +02	3.1347 +00	9.4797 +01
70	3.5208 +00	1.1905 +02	3.5120 +00	1.1615 +02	3.4776 +00	1.0840 +02	3.3518 +00	9.1980 +01
75	3.7761 +00	1.1802 +02	3.7644 +00	1.1492 +02	3.7195 +00	1.0667 +02	3.5590 +00	8.9175 +01
80	4.0282 +00	1.1699 +02	4.0131 +00	1.1370 +02	3.9559 +00	1.0495 +02	3.7557 +00	8.6384 +01
85	4.2769 +00	1.1597 +02	4.2579 +00	1.1249 +02	4.1868 +00	1.0324 +02	3.9415 +00	8.3607 +01
90	4.5220 +00	1.1495 +02	4.4985 +00	1.1129 +02	4.4116 +00	1.0153 +02	4.1159 +00	8.0846 +01
95	4.7632 +00	1.1394 +02	4.7347 +00	1.1009 +02	4.6303 +00	9.9838 +01	4.2786 +00	7.8101 +01
100	5.0006 +00	1.1294 +02	4.9665 +00	1.0890 +02	4.8425 +00	9.8145 +01	4.4291 +00	7.5375 +01

KB	PSI(DEGREES) = 12 G(B)	PHASE(DEGREES	PSI(DEGREES) = 15 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 16 G(B)	PHASE(DEGREES	PSI(DEGREES) = 17 G(B)	PHASE(DEGREES)
10	2.8361 -01	1.2348 +02	2.8696 -01	1.1825 +02	2.8824 -01	1.1626 +02	2.8960 -01	1.1414 +02
15	5.6566 -01	1.1964 +02	5.7092 -01	1.1267 +02	5.7278 -01	1.1001 +02	5.7446 -01	1.0719 +02
20	8.4476 -01	1.1580 +02	8.4907 -01	1.0710 +02	8.5012 -01	1.0377 +02	8.5058 -01	1.0024 +02
25	1.1195 +00	1.1197 +02	1.1186 +00	1.0152 +02	1.1169 +00	9.7539 +01	1.1141 +00	9.3303 +01
30	1.3886 +00	1.0814 +02	1.3770 +00	9.5961 +01	1.3697 +00	9.1313 +01	1.3603 +00	8.6373 +01
35	1.6506 +00	1.0432 +02	1.6215 +00	9.0407 +01	1.6056 +00	8.5097 +01	1.5858 +00	7.9453 +01
40	1.9044 +00	1.0051 +02	1.8499 +00	8.4862 +01	1.8217 +00	7.8892 +01	1.7874 +00	7.2547 +01
45	2.1486 +00	9.6702 +01	2.0599 +00	7.9330 +01	2.0154 +00	7.2701 +01	1.9620 +00	6.5656 +01
50	2.3822 +00	9.2907 +01	2.2496 +00	7.3813 +01	2.1845 +00	6.6527 +01	2.1071 +00	5.8784 +01
55	2.6040 +00	8.9122 +01	2.4172 +00	6.8311 +01	2.3269 +00	6.0371 +01	2.2206 +00	5.1935 +01
60	2.8130 +00	8.5350 +01	2.5611 +00	6.2829 +01	2.4412 +00	5.4239 +01	2.3012 +00	4.5112 +01
65	3.0082 +00	8.1592 +01	2.6800 +00	5.7369 +01	2.5260 +00	4.8132 +01	2.3476 +00	3.8320 +01
70	3.1889 +00	7.7848 +01	2.7731 +00	5.1934 +01	2.5806 +00	4.2056 +01	2.3595 +00	3.1567 +01
75	3.3541 +00	7.4122 +01	2.8395 +00	4.6528 +01	2.6044 +00	3.6015 +01	2.3369 +00	2.4860 +01
80	3.5033 +00	7.0414 +01	2.8788 +00	4.1155 +01	2.5975 +00	3.0018 +01	2.2806 +00	1.8210 +01
85	3.6359 +00	6.6727 +01	2.8908 +00	3.5821 +01	2.5602 +00	2.4071 +01	2.1915 +00	1.1631 +01
90	3.7514 +00	6.3062 +01	2.8758 +00	3.0531 +01	2.4933 +00	1.8185 +01	2.0714 +00	5.1428 +00
95	3.8493 +00	5.9421 +01	2.8342 +00	2.5294 +01	2.3979 +00	1.2375 +01	1.9224 +00	-1.2264 +00
100	3.9295 +00	5.5807 +01	2.7667 +00	2.0118 +01	2.2755 +00	6.6593 +00	1.7472 +00	-7.4261 +00

KB	PSI(DEGREES) = 18 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 19 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 19.5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 20 G(B)	PHASE(DEGREES)
10	2.9104 -01	1.1189 +02	2.9255 -01	1.0953 +02	2.9334 -01	1.0830 +02	2.9415 -01	1.0704 +02
15	5.7655 -01	1.0420 +02	5.7842 -01	1.0104 +02	5.7935 -01	9.9400 +01	5.8026 -01	9.7719 +01
20	8.5128 -01	9.6504 +01	8.5123 -01	9.2559 +01	8.5102 -01	9.0509 +01	8.5067 -01	8.8409 +01
25	1.1101 +00	8.8818 +01	1.1049 +00	8.4085 +01	1.1017 +00	8.1627 +01	1.0982 +00	7.9107 +01
30	1.3484 +00	8.1142 +01	1.3338 +00	7.5621 +01	1.3254 +00	7.2755 +01	1.3161 +00	6.9816 +01
35	1.5618 +00	7.3478 +01	1.5329 +00	6.7173 +01	1.5165 +00	6.3890 +01	1.4988 +00	6.0541 +01
40	1.7463 +00	6.5829 +01	1.6978 +00	5.8740 +01	1.6706 +00	5.5058 +01	1.6414 +00	5.1284 +01
45	1.8987 +00	5.8197 +01	1.8251 +00	5.0328 +01	1.7861 +00	4.6240 +01	1.7403 +00	4.2050 +01
50	2.0164 +00	5.0588 +01	1.9119 +00	4.1941 +01	1.8563 +00	3.7450 +01	1.7930 +00	3.2847 +01
55	2.0974 +00	4.3005 +01	1.9564 +00	3.3585 +01	1.8796 +00	2.8694 +01	1.7983 +00	2.3682 +01
60	2.1403 +00	3.5493 +01	1.9585 +00	2.5269 +01	1.8599 +00	1.9982 +01	1.7563 +00	1.4566 +01
65	2.1446 +00	2.7961 +01	1.9176 +00	1.7003 +01	1.7957 +00	1.1328 +01	1.6685 +00	5.5187 +00
70	2.1105 +00	2.0478 +01	1.8353 +00	8.8034 +00	1.6889 +00	2.7530 +00	1.5375 +00	-3.4340 +00
75	2.0388 +00	1.3077 +01	1.7137 +00	6.9294 -01	1.5426 +00	-5.7116 +00	1.3670 +00	-1.2245 +01
80	1.9314 +00	5.7575 +00	1.5557 +00	-7.2910 +00	1.3605 +00	-1.4010 +01	1.1621 +00	-2.0828 +01
85	1.7903 +00	-1.4596 +00	1.3653 +00	-1.5084 +01	1.1675 +00	-2.2037 +01	9.2853 -01	-2.8995 +01
90	1.6186 +00	-8.5117 +00	1.1471 +00	-2.2567 +01	9.0926 -01	-2.9565 +01	6.7317 -01	-3.6258 +01
95	1.4197 +00	-1.5342 +01	9.0636 -01	-2.9676 +01	6.5223 -01	-3.5991 +01	4.0431 -01	-4.0800 +01
100	1.1978 +00	-2.1808 +01	6.4937 -01	-3.5120 +01	3.8479 -01	-3.9000 +01	1.4106 -01	-2.6796 +01

KB	PSI(DEGREES) = 20.5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 21 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 21.5 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 22 G(B)	PHASE(DEGREES)
10	2.9497 -01	1.0574 +02	2.9582 -01	1.0462 +02	2.9668 -01	1.0307 +02	2.9757 -01	1.0169 +02
15	5.8116 -01	9.5998 +01	5.8204 -01	9.4235 +01	5.8290 -01	9.2433 +01	5.8374 -01	9.0590 +01
20	8.5018 -01	8.6257 +01	8.4952 -01	8.4055 +01	8.4869 -01	8.1802 +01	8.4768 -01	7.9498 +01
25	1.0942 +00	7.6525 +01	1.0897 +00	7.3883 +01	1.0848 +00	7.1180 +01	1.0795 +00	6.8417 +01
30	1.3060 +00	6.6806 +01	1.2951 +00	6.3725 +01	1.2832 +00	6.0572 +01	1.2704 +00	5.7369 +01
35	1.4797 +00	5.7102 +01	1.4591 +00	5.3582 +01	1.4370 +00	4.9982 +01	1.4133 +00	4.6300 +01
40	1.6101 +00	4.7418 +01	1.5766 +00	4.3461 +01	1.5409 +00	3.9414 +01	1.5030 +00	3.5276 +01
45	1.6937 +00	3.7759 +01	1.6441 +00	3.3368 +01	1.5916 +00	2.8875 +01	1.5362 +00	2.4283 +01
50	1.7281 +00	2.8133 +01	1.6596 +00	2.3310 +01	1.5876 +00	1.8376 +01	1.5121 +00	1.3334 +01
55	1.7127 +00	1.8550 +01	1.6229 +00	1.3300 +01	1.5291 +00	7.9316 +00	1.4316 +00	2.4473 +00
60	1.6481 +00	9.0237 +00	1.5354 +00	3.3556 +00	1.4186 +00	-2.4357 +00	1.2982 +00	-8.3473 +00
65	1.5365 +00	-4.2268 -01	1.4002 +00	-6.4922 +00	1.2602 +00	-1.2684 +01	1.1171 +00	-1.8992 +01
70	1.3815 +00	-9.7513 +00	1.2220 +00	-1.6190 +01	1.0597 +00	-2.2734 +01	8.9568 -01	-2.9361 +01
75	1.1880 +00	-1.8892 +01	1.0067 +00	-2.5627 +01	8.2436 -01	-3.2400 +01	6.4255 -01	-3.9111 +01
80	9.6188 -01	-2.7700 +01	7.6156 -01	-3.4537 +01	5.6294 -01	-4.1128 +01	3.6010 -01	-4.6842 +01
85	7.1032 -01	-3.5804 +01	4.9519 -01	-4.2051 +01	2.8599 -01	-4.6175 +01	9.1228 -02	-3.5449 +01
90	4.4166 -01	-4.1902 +01	2.1911 -01	-4.2856 +01	5.4768 -02	2.8970 +01	2.1606 -01	9.0972 +01
95	1.7009 -01	-3.6236 +01	9.7219 -02	7.1437 +01	2.9581 -01	9.1407 +01	4.9105 -01	8.7359 +01
100	1.4608 -01	8.1227 +01	3.6108 -01	9.1045 +01	5.6559 -01	8.6115 +01	7.4785 -01	7.8480 +01

KB	PSI(DEGREES) = 23 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 24 G(B)	PHASE(DEGREES)	PSI(DEGREES) = 25 G(B)	PHASE(DEGREES)
10	2.9939 -01	9.8833 +01	3.0129 -01	9.5857 +01	3.0327 -01	9.2763 +01
15	5.8532 -01	8.6783 +01	5.8678 -01	8.2816 +01	5.8807 -01	7.8691 +01
20	8.4508 -01	7.4740 +01	8.4167 -01	6.9783 +01	8.3721 -01	6.4627 +01
25	1.0671 +00	6.2709 +01	1.0526 +00	5.6761 +01	1.0357 +00	5.0576 +01
30	1.2417 +00	5.0693 +01	1.2089 +00	4.3757 +01	1.1716 +00	3.6544 +01
35	1.3612 +00	3.8697 +01	1.3024 +00	3.0776 +01	1.2369 +00	2.2538 +01
40	1.4203 +00	2.6730 +01	1.3286 +00	1.7827 +01	1.2778 +00	8.5704 +00
45	1.4168 +00	1.4801 +01	1.2867 +00	4.9250 +00	1.1452 +00	-5.3385 +00
50	1.3510 +00	2.9267 +00	1.1779 +00	-7.9049 +00	9.9437 -01	-1.9148 +01
55	1.2262 +00	-8.8635 +00	1.0094 +00	-2.0613 +01	7.8463 -01	-3.2765 +01
60	1.0481 +00	-2.0514 +01	7.8980 -01	-3.3024 +01	5.2901 -01	-4.5891 +01
65	8.2499 -01	-3.1897 +01	5.3094 -01	-4.4952 +01	2.4353 -01	-5.6786 +01
70	5.6720 -01	-4.2628 +01	2.4699 -01	-5.4119 +01	6.1614 -02	8.0614 +01
75	2.8700 -01	-5.0784 +01	5.8918 -02	7.5317 +01	3.5144 -01	8.5780 +01
80	3.8617 -02	3.1086 +01	3.4331 -01	8.8119 +01	6.2217 -01	7.3627 +01
85	2.9971 -01	9.0640 +01	6.1491 -01	7.7521 +01	8.5420 -01	6.0417 +01
90	5.7313 -01	8.2295 +01	8.5266 -01	6.5536 +01	1.0337 +00	4.6951 +01
95	8.2016 -01	7.1668 +01	1.0456 +00	5.3203 +01	1.1505 +00	3.3427 +01
100	1.0296 +00	6.0496 +01	1.1832 +00	4.0770 +01	1.1915 +00	1.9938 +01

Table 4

KA=5
DELTA(DEGREES)=15

KB	PSI(DEGREES) = 0 G(B)	PSI(DEGREES) = 0 PHASE(DEGREES)	PSI(DEGREES) = 1 G(B)	PSI(DEGREES) = 1 PHASE(DEGREES)	PSI(DEGREES) = 2 G(B)	PSI(DEGREES) = 2 PHASE(DEGREES)	PSI(DEGREES) = 3 G(B)	PSI(DEGREES) = 3 PHASE(DEGREES)
10	4.1534 -01	1.3010 +02	4.1541 -01	1.3003 +02	4.1559 -01	1.2984 +02	4.1590 -01	1.2951 +02
15	8.2819 -01	1.2847 +02	8.2830 -01	1.2838 +02	8.2865 -01	1.2812 +02	8.2922 -01	1.2769 +02
20	1.2371 +00	1.2685 +02	1.2373 +00	1.2676 +02	1.2377 +00	1.2642 +02	1.2385 +00	1.2588 +02
25	1.6408 +00	1.2525 +02	1.6410 +00	1.2512 +02	1.6415 +00	1.2475 +02	1.6423 +00	1.2409 +02
30	2.0380 +00	1.2366 +02	2.0381 +00	1.2351 +02	2.0385 +00	1.2306 +02	2.0392 +00	1.2231 +02
35	2.4273 +00	1.2209 +02	2.4274 +00	1.2192 +02	2.4276 +00	1.2141 +02	2.4279 +00	1.2055 +02
40	2.8077 +00	1.2055 +02	2.8076 +00	1.2036 +02	2.8075 +00	1.1978 +02	2.8071 +00	1.1882 +02
45	3.1779 +00	1.1904 +02	3.1777 +00	1.1882 +02	3.1771 +00	1.1818 +02	3.1758 +00	1.1712 +02
50	3.5371 +00	1.1755 +02	3.5367 +00	1.1732 +02	3.5354 +00	1.1662 +02	3.5329 +00	1.1545 +02
55	3.8843 +00	1.1610 +02	3.8837 +00	1.1584 +02	3.8815 +00	1.1508 +02	3.8775 +00	1.1382 +02
60	4.2188 +00	1.1468 +02	4.2178 +00	1.1441 +02	4.2145 +00	1.1359 +02	4.2087 +00	1.1222 +02
65	4.5399 +00	1.1331 +02	4.5384 +00	1.1302 +02	4.5339 +00	1.1214 +02	4.5258 +00	1.1068 +02
70	4.8470 +00	1.1198 +02	4.8451 +00	1.1167 +02	4.8391 +00	1.1073 +02	4.8285 +00	1.0917 +02
75	5.1397 +00	1.1070 +02	5.1373 +00	1.1037 +02	5.1297 +00	1.0938 +02	5.1161 +00	1.0773 +02
80	5.4179 +00	1.0947 +02	5.4149 +00	1.0912 +02	5.4055 +00	1.0808 +02	5.3887 +00	1.0633 +02
85	5.6814 +00	1.0830 +02	5.6777 +00	1.0793 +02	5.6663 +00	1.0683 +02	5.6460 +00	1.0500 +02
90	5.9302 +00	1.0718 +02	5.9258 +00	1.0680 +02	5.9123 +00	1.0564 +02	5.8882 +00	1.0372 +02
95	6.1649 +00	1.0612 +02	6.1594 +00	1.0572 +02	6.1436 +00	1.0452 +02	6.1155 +00	1.0251 +02
100	6.3847 +00	1.0513 +02	6.3789 +00	1.0471 +02	6.3607 +00	1.0346 +02	6.3284 +00	1.0137 +02

KB	PSI(DEGREES) = 4 G(B)	PSI(DEGREES) = 4 PHASE(DEGREES)	PSI(DEGREES) = 5 G(B)	PSI(DEGREES) = 5 PHASE(DEGREES)	PSI(DEGREES) = 7 G(B)	PSI(DEGREES) = 7 PHASE(DEGREES)	PSI(DEGREES) = 12 G(B)	PSI(DEGREES) = 12 PHASE(DEGREES)
10	4.1634 -01	1.2906 +02	4.1690 -01	1.2848 +02	4.1838 -01	1.2693 +02	4.2425 -01	1.2081 +02
15	8.3002 -01	1.2709 +02	8.3104 -01	1.2632 +02	8.3370 -01	1.2425 +02	8.4352 -01	1.1610 +02
20	1.2395 +00	1.2513 +02	1.2408 +00	1.2416 +02	1.2440 +00	1.2158 +02	1.2539 +00	1.1141 +02
25	1.6433 +00	1.2319 +02	1.6445 +00	1.2203 +02	1.6474 +00	1.1894 +02	1.6518 +00	1.0674 +02
30	2.0399 +00	1.2126 +02	2.0408 +00	1.1991 +02	2.0421 +00	1.1631 +02	2.0337 +00	1.0211 +02
35	2.4281 +00	1.1936 +02	2.4280 +00	1.1782 +02	2.4263 +00	1.1371 +02	2.3964 +00	9.7520 +01
40	2.8064 +00	1.1748 +02	2.8069 +00	1.1575 +02	2.7985 +00	1.1115 +02	2.7369 +00	9.2981 +01
45	3.1737 +00	1.1563 +02	3.1702 +00	1.1372 +02	3.1572 +00	1.0862 +02	3.0526 +00	8.8500 +01
50	3.5289 +00	1.1382 +02	3.5228 +00	1.1172 +02	3.5011 +00	1.0614 +02	3.3416 +00	8.4086 +01
55	3.8711 +00	1.1205 +02	3.8616 +00	1.0977 +02	3.8291 +00	1.0370 +02	3.6014 +00	7.9749 +01
60	4.1994 +00	1.1031 +02	4.1858 +00	1.0786 +02	4.1403 +00	1.0131 +02	3.8324 +00	7.5497 +01
65	4.5132 +00	1.0863 +02	4.4948 +00	1.0600 +02	4.4339 +00	9.8984 +01	4.0323 +00	7.1340 +01
70	4.8119 +00	1.0699 +02	4.7880 +00	1.0419 +02	4.7094 +00	9.6719 +01	4.2013 +00	6.7289 +01
75	5.0952 +00	1.0541 +02	5.0650 +00	1.0244 +02	4.9664 +00	9.4522 +01	4.3395 +00	6.3355 +01
80	5.3629 +00	1.0389 +02	5.3257 +00	1.0075 +02	5.2050 +00	9.2397 +01	4.4476 +00	5.9567 +01
85	5.6148 +00	1.0243 +02	5.5700 +00	9.9131 +01	5.4252 +00	9.0350 +01	4.5268 +00	5.5877 +01
90	5.8513 +00	1.0103 +02	5.7982 +00	9.7579 +01	5.6273 +00	8.8384 +01	4.5785 +00	5.2355 +01
95	6.0724 +00	9.9707 +01	6.0107 +00	9.6101 +01	5.8121 +00	8.6505 +01	4.6048 +00	4.8991 +01
100	6.2789 +00	9.8452 +01	6.2080 +00	9.4699 +01	5.9802 +00	8.4715 +01	4.6079 +00	4.5796 +01

KB	PSI(DEGREES) = 14 G(B)	PSI(DEGREES) = 14 PHASE(DEGREES)	PSI(DEGREES) = 15 G(B)	PSI(DEGREES) = 15 PHASE(DEGREES)	PSI(DEGREES) = 16 G(B)	PSI(DEGREES) = 16 PHASE(DEGREES)	PSI(DEGREES) = 17 G(B)	PSI(DEGREES) = 17 PHASE(DEGREES)
10	4.2745 -01	1.1748 +02	4.2923 -01	1.1562 +02	4.3113 -01	1.1364 +02	4.3315 -01	1.1156 +02
15	8.4839 -01	1.1166 +02	8.5095 -01	1.0918 +02	8.5356 -01	1.0654 +02	8.5619 -01	1.0374 +02
20	1.2575 +00	1.0586 +02	1.2589 +00	1.0277 +02	1.2599 +00	9.9472 +01	1.2604 +00	9.5968 +01
25	1.6496 +00	1.0009 +02	1.6670 +00	9.6389 +01	1.6630 +00	9.2438 +01	1.6375 +00	8.8238 +01
30	2.0201 +00	9.4364 +01	2.0097 +00	9.0053 +01	1.9965 +00	8.5452 +01	1.9800 +00	8.0562 +01
35	2.3646 +00	8.8688 +01	2.3422 +00	8.3773 +01	2.3147 +0	7.8527 +01	2.2814 +00	7.2951 +01
40	2.6792 +00	8.3075 +01	2.6400 +00	7.7559 +01	2.5926 +00	7.1675 +01	2.5362 +00	6.5422 +01
45	2.9608 +00	7.7529 +01	2.8995 +00	7.1424 +01	2.8264 +00	6.4910 +01	2.7404 +00	5.7990 +01
50	3.2068 +00	7.2067 +01	3.1181 +00	6.5382 +01	3.0132 +00	5.8250 +01	2.8909 +00	5.0675 +01
55	3.4152 +00	6.6701 +01	3.2937 +00	5.9446 +01	3.1512 +00	5.1711 +01	2.9865 +00	4.3501 +01
60	3.5848 +00	6.1443 +01	3.4253 +00	5.3635 +01	3.2397 +00	4.5316 +01	3.0270 +00	3.6495 +01
65	3.7151 +00	5.6308 +01	3.5129 +00	4.7966 +01	3.2793 +00	3.9088 +01	3.0138 +00	2.9691 +01
70	3.8065 +00	5.1313 +01	3.5571 +00	4.2460 +01	3.2715 +00	3.3056 +01	2.9497 +00	2.3131 +01
75	3.8598 +00	4.6473 +01	3.5598 +00	3.7142 +01	3.2189 +00	2.7256 +01	2.8387 +00	1.6870 +01
80	3.8767 +00	4.1809 +01	3.5232 +00	3.2038 +01	3.1251 +00	2.1730 +01	2.6858 +00	1.0977 +01
85	3.8595 +00	3.7340 +01	3.4507 +00	2.7179 +01	2.9946 +00	1.6528 +01	2.4972 +00	5.5504 +00
90	3.8110 +00	3.3088 +01	3.3460 +00	2.2601 +01	2.8325 +00	1.1717 +01	2.2800 +00	7.2241 -01
95	3.7345 +00	2.9077 +01	3.2135 +00	1.8345 +01	2.6447 +00	7.3762 +00	2.0421 +00	-3.3154 +00
100	3.6337 +00	2.5331 +01	3.0581 +00	1.4458 +01	2.4377 +00	3.6124 +00	1.7925 +00	-6.2803 +00

KB	PSI(DEGREES) = 18 G(B)	PSI(DEGREES) = 18 PHASE(DEGREES)	PSI(DEGREES) = 19 G(B)	PSI(DEGREES) = 19 PHASE(DEGREES)	PSI(DEGREES) = 20 G(B)	PSI(DEGREES) = 20 PHASE(DEGREES)	PSI(DEGREES) = 21 G(B)	PSI(DEGREES) = 21 PHASE(DEGREES)
10	4.3528 -01	1.0931 +02	4.3753 -01	1.0696 +02	4.3990 -01	1.0448 +02	4.4238 -01	1.0188 +02
15	8.5883 -01	1.0077 +02	8.6144 -01	9.7632 +01	8.6398 -01	9.6334 +01	8.6643 -01	9.0875 +01
20	1.2603 +00	9.2258 +01	1.2596 +00	8.8343 +01	1.2581 +00	8.4224 +01	1.2557 +00	7.9903 +01
25	1.6302 +00	8.3792 +01	1.6209 +00	7.9101 +01	1.6094 +00	7.4165 +01	1.5953 +00	6.8986 +01
30	1.9598 +00	7.5384 +01	1.9354 +00	6.9921 +01	1.9065 +00	6.4173 +01	1.8726 +00	5.8143 +01
35	2.2417 +00	6.7048 +01	2.1944 +00	6.0820 +01	2.1404 +00	5.4268 +01	2.0778 +00	4.7396 +01
40	2.4699 +00	5.8802 +01	2.3930 +00	5.1819 +01	2.3045 +00	4.4475 +01	2.2041 +00	3.6775 +01
45	2.6403 +00	5.0666 +01	2.5254 +00	4.2962 +01	2.3949 +00	3.4824 +01	2.2485 +00	2.6317 +01
50	2.7501 +00	4.2664 +01	2.5900 +00	3.4221 +01	2.4103 +00	2.5355 +01	2.2111 +00	1.6078 +01
55	2.7985 +00	3.4825 +01	2.5871 +00	2.5694 +01	2.3525 +00	1.6124 +01	2.0958 +00	6.1976 +00
60	2.7866 +00	2.7189 +01	2.5190 +00	1.7416 +01	2.2258 +00	7.2106 +00	1.9097 +00	-3.3747 +00
65	2.7169 +00	1.9802 +01	2.3902 +00	9.4621 +00	2.0372 +00	-1.2599 +00	1.6628 +00	-1.2212 +01
70	2.5937 +00	1.2732 +01	2.2072 +00	1.9420 +00	1.7958 +00	-9.0798 +00	1.3681 +00	-1.9987 +01
75	2.4230 +00	6.0710 +00	1.9781 +00	-4.9671 +00	1.5134 +00	-1.5870 +01	1.0421 +00	-2.5619 +01
80	2.2118 +00	-4.8177 -02	1.7130 +00	-1.0975 +01	1.2040 +00	-2.0857 +01	7.0816 -01	-2.6230 +01
85	1.9686 +00	-5.4208 +00	1.4239 +00	-1.5565 +01	8.8692 -01	-2.2206 +01	4.1930 -01	-1.1417 +01
90	1.7033 +00	-9.7184 +00	1.1259 +00	-1.7675 +01	5.9663 -01	-1.4900 +01	3.5317 -01	3.4597 +01
95	1.4276 +00	-1.2383 +01	8.4130 -01	-1.5063 +01	4.2309 -01	1.2012 +01	5.6921 -01	6.0387 +01
100	1.1563 +00	-1.2419 +01	6.1250 -01	-2.9460 +00	4.9478 -01	4.6075 +01	8.4685 -01	6.3836 +01

KB	PSI(DEGREES) = 21.5 G(B)	PSI(DEGREES) = 21.5 PHASE(DEGREES)	PSI(DEGREES) = 22 G(B)	PSI(DEGREES) = 22 PHASE(DEGREES)	PSI(DEGREES) = 23 G(B)	PSI(DEGREES) = 23 PHASE(DEGREES)	PSI(DEGREES) = 24 G(B)	PSI(DEGREES) = 24 PHASE(DEGREES)
10	4.4366 -01	1.0054 +02	4.4497 -01	9.9167 +01	4.4768 -01	9.6330 +01	4.5051 -01	9.3374 +01
15	8.6760 01	8.9084 +01	8.6874 -01	8.7254 +01	8.7089 -01	8.3473 +01	8.7283 -01	7.9533 +01
20	1.2541 +00	7.7667 +01	1.2522 +00	7.5381 +01	1.2476 +00	7.0659 +01	1.2417 +00	6.5738 +01
25	1.5872 +00	6.6306 +01	1.5784 +00	6.3967 +01	1.5585 +00	5.7908 +01	1.5353 +00	5.2011 +01
30	1.8536 +00	5.5023 +01	1.8337 +00	5.1833 +01	1.7882 +00	4.5244 +01	1.7370 +00	3.8380 +01
35	2.0432 +00	4.3860 +01	2.0064 +00	4.0206 +01	1.9258 +00	3.2700 +01	1.8358 +00	2.4882 +01
40	2.1493 +00	3.2792 +01	2.0913 +00	2.8721 +01	1.9658 +00	2.0319 +01	1.8277 +00	1.1574 +01
45	2.1693 +00	2.1920 +01	2.0861 +00	1.7429 +01	1.9081 +00	8.1676 +00	1.7151 +00	-1.4520 +00
50	2.1044 +00	1.1290 +01	1.9932 +00	6.4043 +00	1.7579 +00	-3.6424 +00	1.5073 +00	-1.4024 +01
55	1.9598 +00	9.9917 -01	1.8192 +00	-4.2276 +00	1.5257 +00	-1.4907 +01	1.2196 +00	-2.5772 +01
60	1.7443 +00	-8.7820 +00	1.5748 +00	-1.4241 +01	1.2267 +00	-2.5184 +01	8.7274 -01	-3.5681 +01
65	1.4697 +00	-1.7733 +01	1.2741 +00	-2.3167 +01	8.5049 -01	-3.3295 +01	4.9593 -01	-3.9597 +01
70	1.1515 +00	-2.5153 +01	9.3545 -01	-2.9823 +01	5.1599 -01	-3.4714 +01	1.8663 -01	-1.2075 +00
75	8.0999 -01	-2.9144 +01	5.8577 -01	-3.0234 +01	2.2982 -01	2.4748 -01	3.8496 -01	6.5933 +01
80	4.8145 -01	-2.2816 +01	3.0180 -01	-5.2151 +00	3.8397 -01	6.1795 +01	7.2934 -01	6.6692 +01
85	3.0025 -01	1.8334 +01	3.6189 -01	5.2492 +01	7.0868 -01	6.6964 +01	1.0373 +00	5.8551 +01
90	4.7090 -01	5.8529 +01	6.5242 -01	6.5742 +01	1.0119 +00	6.1154 +01	1.2821 +00	4.8399 +01
95	7.5961 -01	6.6956 +01	9.4859 -01	6.3381 +01	1.2630 +00	5.2688 +01	1.4512 +00	3.7702 +01
100	1.0377 +00	6.1804 +01	1.2070 +00	5.7030 +01	1.4498 +00	4.3399 +01	1.5388 +00	2.7014 +01

KB	PSI(DEGREES) = 25 G(B)	PSI(DEGREES) = 25 PHASE(DEGREES)
10	4.5344 -01	9.0300 +01
15	8.7453 -01	7.5436 +01
20	1.2349 +00	6.0621 +01
25	1.5086 +00	4.5879 +01
30	1.6793 +00	3.1242 +01
35	1.7362 +00	1.6756 +01
40	1.6772 +00	2.4938 +00
45	1.5086 +00	-1.1410 +01
50	1.2445 +00	-2.4672 +01
55	9.0632 -01	-3.6529 +01
60	5.2297 -01	-4.3896 +01
65	1.6973 -01	-1.5124 +01
70	3.5366 -01	6.7451 +01
75	7.1385 -01	6.6208 +01
80	1.0292 +00	5.6319 +01
85	1.2719 +00	4.4689 +01
90	1.4279 +00	3.2660 +01
95	1.4913 +00	2.0749 +01
100	1.4632 +00	9.3076 +00

Table 5

KA=5
DELTA(DEGREES)=20

	PSI(DEGREES) = 0		PSI(DEGREES) = 1		PSI(DEGREES) = 2		PSI(DEGREES) = 3	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.5000 -01	1.2630 +02	5.5008 -01	1.2623 +02	5.5032 -01	1.2604 +02	5.5075 -01	1.2572 +02
15	1.0896 +00	1.2344 +02	1.0897 +00	1.2336 +02	1.0902 +00	1.2310 +02	1.0909 +00	1.2268 +02
20	1.6132 +00	1.2066 +02	1.6136 +00	1.2054 +02	1.6139 +00	1.2022 +02	1.6147 +00	1.1969 +02
25	2.1158 +00	1.1792 +02	2.1159 +00	1.1779 +02	2.1163 +00	1.1741 +02	2.1170 +00	1.1678 +02
30	2.5928 +00	1.1529 +02	2.5929 +00	1.1514 +02	2.5930 +00	1.1470 +02	2.5931 +00	1.1397 +02
35	3.0406 +00	1.1278 +02	3.0405 +00	1.1261 +02	3.0401 +00	1.1211 +02	3.0393 +00	1.1128 +02
40	3.4563 +00	1.1040 +02	3.4559 +00	1.1021 +02	3.4548 +00	1.0965 +02	3.4527 +00	1.0872 +02
45	3.8381 +00	1.0817 +02	3.8374 +00	1.0797 +02	3.8352 +00	1.0736 +02	3.8314 +00	1.0633 +02
50	4.1851 +00	1.0612 +02	4.1840 +00	1.0590 +02	4.1806 +00	1.0523 +02	4.1747 +00	1.0412 +02
55	4.4977 +00	1.0427 +02	4.4961 +00	1.0403 +02	4.4914 +00	1.0331 +02	4.4831 +00	1.0211 +02
60	4.7772 +00	1.0261 +02	4.7752 +00	1.0236 +02	4.7693 +00	1.0159 +02	4.7580 +00	1.0031 +02
65	5.0262 +00	1.0118 +02	5.0237 +00	1.0091 +02	5.0159 +00	1.0010 +02	5.0022 +00	9.8741 +01
70	5.2481 +00	9.9979 +01	5.2451 +00	9.9593 +01	5.2357 +00	9.8836 +01	5.2194 +00	9.7407 +01
75	5.4472 +00	9.9007 +01	5.4437 +00	9.8707 +01	5.4329 +00	9.7809 +01	5.4140 +00	9.6312 +01
80	5.6282 +00	9.8262 +01	5.6243 +00	9.7949 +01	5.6123 +00	9.7012 +01	5.5912 +00	9.5449 +01
85	5.7965 +00	9.7752 +01	5.7923 +00	9.7407 +01	5.7793 +00	9.6431 +01	5.7563 +00	9.4805 +01
90	5.9573 +00	9.7398 +01	5.9529 +00	9.7060 +01	5.9391 +00	9.6046 +01	5.9147 +00	9.4357 +01
95	6.1155 +00	9.7230 +01	6.1110 +00	9.6879 +01	6.0966 +00	9.5828 +01	6.0714 +00	9.4075 +01
100	6.2754 +00	9.7194 +01	6.2708 +00	9.6831 +01	6.2565 +00	9.5739 +01	5.2306 +00	9.3970 +01

	PSI(DEGREES) = 4		PSI(DEGREES) = 5		PSI(DEGREES) = 7		PSI(DEGREES) = 10	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.5131 -01	1.2527 +02	5.5206 -01	1.2470 +02	5.5401 -01	1.2316 +02	5.5816 -01	1.1990 +02
15	1.0919 +00	1.2208 +02	1.0931 +00	1.2131 +02	1.0965 +00	1.1927 +02	1.1032 +00	1.1493 +02
20	1.6158 +00	1.1894 +02	1.6173 +00	1.1799 +02	1.6208 +00	1.1546 +02	1.6270 +00	1.1004 +02
25	2.1178 +00	1.1589 +02	2.1188 +00	1.1475 +02	2.1208 +00	1.1171 +02	2.1222 +00	1.0525 +02
30	2.5932 +00	1.1294 +02	2.5930 +00	1.1161 +02	2.5915 +00	1.0808 +02	2.5825 +00	1.0060 +02
35	3.0380 +00	1.1011 +02	3.0360 +00	1.0860 +02	3.0285 +00	1.0460 +02	3.0031 +00	9.6108 +01
40	3.4494 +00	1.0742 +02	3.4446 +00	1.0574 +02	3.4288 +00	1.0128 +02	3.3804 +00	9.1809 +01
45	3.8255 +00	1.0490 +02	3.8172 +00	1.0306 +02	3.7906 +00	9.8146 +01	3.7128 +00	8.7792 +01
50	4.1658 +00	1.0256 +02	4.1531 +00	1.0056 +02	4.1134 +00	9.5222 +01	4.0002 +00	8.3906 +01
55	4.4705 +00	1.0043 +02	4.4530 +00	9.8274 +01	4.3982 +00	9.2530 +01	4.2443 +00	8.0155 +01
60	4.7416 +00	9.8520 +01	4.7186 +00	9.6218 +01	4.6473 +00	9.0088 +01	4.4486 +00	7.7102 +01
65	4.9817 +00	9.6843 +01	4.9531 +00	9.4404 +01	4.8644 +00	8.7909 +01	4.6160 +00	7.4161 +01
70	5.1949 +00	9.5408 +01	5.1606 +00	9.2840 +01	5.0541 +00	8.6000 +01	4.7565 +00	7.1536 +01
75	5.3856 +00	9.4217 +01	5.3458 +00	9.1525 +01	5.2219 +00	8.4359 +01	4.8771 +00	6.9220 +01
80	5.5593 +00	9.3262 +01	5.5144 +00	9.0453 +01	5.3740 +00	8.2976 +01	4.9809 +00	6.7193 +01
85	5.7214 +00	9.2529 +01	5.6721 +00	8.9605 +01	5.5165 +00	8.1821 +01	5.0765 +00	6.5409 +01
90	5.8774 +00	9.1993 +01	5.8244 +00	8.8954 +01	5.6550 +00	8.0866 +01	5.1698 +00	6.3822 +01
95	6.0324 +00	9.1620 +01	5.9763 +00	8.8466 +01	5.7946 +00	8.0067 +01	5.2649 +00	6.2377 +01
100	6.1904 +00	9.1373 +01	6.1318 +00	8.8094 +01	5.9388 +00	7.9375 +01	5.3642 +00	6.1002 +01

	PSI(DEGREES) = 12		PSI(DEGREES) = 13		PSI(DEGREES) = 14		PSI(DEGREES) = 15	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.6174 -01	1.1710 +02	5.6377 -01	1.1551 +02	5.6596 -01	1.1380 +02	5.6831 -01	1.1196 +02
15	1.1087 +00	1.1120 +02	1.1116 +00	1.0909 +02	1.1147 +00	1.0681 +02	1.1176 +00	1.0436 +02
20	1.6310 +00	1.0539 +02	1.6328 +00	1.0276 +02	1.6342 +00	9.9912 +01	1.6352 +00	9.6861 +01
25	2.1202 +00	9.9699 +01	2.1176 +00	9.6548 +01	2.1138 +00	9.3149 +01	2.1085 +00	8.9504 +01
30	2.5686 +00	9.4156 +01	2.5581 +00	9.0501 +01	2.5447 +00	8.6558 +01	2.5280 +00	8.2329 +01
35	2.9766 +00	8.8797 +01	2.9461 +00	8.4650 +01	2.9263 +00	8.0177 +01	2.8865 +00	7.5380 +01
40	3.3228 +00	8.3657 +01	3.2837 +00	7.9034 +01	3.2364 +00	7.4049 +01	3.1798 +00	6.8703 +01
45	3.6232 +00	7.8772 +01	3.5633 +00	7.3692 +01	3.4915 +00	6.8216 +01	3.4066 +00	6.2347 +01
50	3.8722 +00	7.4174 +01	3.7876 +00	6.8663 +01	3.6870 +00	6.2721 +01	3.5688 +00	5.6361 +01
55	4.0725 +00	6.9895 +01	3.9598 +00	6.3975 +01	3.8266 +00	5.7603 +01	3.6711 +00	5.0790 +01
60	4.2287 +00	6.5960 +01	4.0853 +00	5.9663 +01	3.9166 +00	5.2897 +01	3.7209 +00	4.5677 +01
65	4.3468 +00	6.2386 +01	4.1747 +00	5.5745 +01	3.9650 +00	4.8623 +01	3.7272 +00	4.1047 +01
70	4.4344 +00	5.9176 +01	4.2251 +00	5.2222 +01	3.9846 +00	4.4788 +01	3.7065 +00	3.6911 +01
75	4.4994 +00	5.6316 +01	4.2562 +00	4.9081 +01	3.9737 +00	4.1372 +01	3.6510 +00	3.3249 +01
80	4.5496 +00	5.3775 +01	4.2728 +00	4.6281 +01	3.9522 +00	3.8331 +01	3.5879 +00	3.0012 +01
85	4.5924 +00	5.1500 +01	4.2818 +00	4.3761 +01	3.9234 +00	3.5593 +01	3.5182 +00	2.7118 +01
90	4.6326 +00	4.9423 +01	4.2882 +00	4.1444 +01	3.8919 +00	3.3069 +01	3.4460 +00	2.4463 +01
95	4.6737 +00	4.7466 +01	4.2946 +00	3.9241 +01	3.8593 +00	3.0659 +01	3.3720 +00	2.1939 +01
100	4.7166 +00	4.5552 +01	4.3048 +00	3.7068 +01	3.8244 +00	2.9273 +01	3.2938 +00	1.9451 +01

	PSI(DEGREES) = 16		PSI(DEGREES) = 17		PSI(DEGREES) = 18		PSI(DEGREES) = 19	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.7081 -01	1.1000 +02	5.7347 -01	1.0791 +02	5.7628 -01	1.0570 +02	5.7925 -01	1.0317 +02
15	1.1211 +00	1.0175 +02	1.1243 +00	9.8969 +01	1.1279 +00	9.6029 +01	1.1337 +00	9.2927 +01
20	1.6356 +00	9.3604 +01	1.6354 +00	9.0143 +01	1.6344 +00	8.6478 +01	1.6375 +00	8.2610 +01
25	2.1013 +00	8.5612 +01	2.0921 +00	8.1475 +01	2.0805 +00	7.7095 +01	2.0663 +00	7.2473 +01
30	2.5074 +00	7.7816 +01	2.4825 +00	7.3016 +01	2.4527 +00	6.7936 +01	2.4176 +00	6.2576 +01
35	2.8461 +00	7.0260 +01	2.7982 +00	6.4819 +01	2.7421 +00	5.9060 +01	2.6771 +00	5.2985 +01
40	3.1130 +00	6.3000 +01	3.0348 +00	5.6942 +01	2.9445 +00	5.0534 +01	2.8410 +00	4.3779 +01
45	3.3072 +00	5.6090 +01	3.1922 +00	4.9653 +01	3.0606 +00	4.2433 +01	2.9110 +00	3.5049 +01
50	3.4318 +00	4.9588 +01	3.2739 +00	4.2411 +01	3.0950 +00	3.4843 +01	2.8941 +00	2.6932 +01
55	3.4917 +00	4.3549 +01	3.2874 +00	3.5895 +01	3.0575 +00	2.7855 +01	2.8021 +00	1.9464 +01
60	3.4966 +00	3.8024 +01	3.2431 +00	2.9972 +01	2.9605 +00	2.1965 +01	2.6501 +00	1.2876 +01
65	3.4567 +00	3.3053 +01	3.1534 +00	2.4697 +01	2.8187 +00	1.6463 +01	2.4558 +00	7.2944 +00
70	3.3837 +00	2.8653 +01	3.0316 +00	2.0105 +01	2.6476 +00	1.1422 +01	2.2373 +00	2.8744 +00
75	3.2889 +00	2.4807 +01	2.8906 +00	1.6197 +01	2.4614 +00	7.6822 +00	2.0116 +00	-2.4309 -01
80	3.1822 +00	2.1465 +01	2.7434 +00	1.2927 +01	2.2719 +00	4.8329 +00	1.7927 +00	-1.9519 +00
85	3.0705 +00	1.8537 +01	2.5886 +00	1.0269 +01	2.0867 +00	2.8202 +00	1.5890 +00	-2.1821 +00
90	2.9573 +00	1.5908 +01	2.4380 +00	7.9283 +00	1.7089 +00	1.5732 +00	1.4067 +00	-8.6112 -01
95	2.8423 +00	1.3466 +01	2.2877 +00	5.9864 +00	1.7377 +00	1.0686 +00	1.2477 +00	2.1743 +00
100	2.7225 +00	1.1123 +01	2.1341 +00	4.7411 +00	1.5709 +00	1.4187 +00	1.1157 +00	3.2494 +00

	PSI(DEGREES) = 20		PSI(DEGREES) = 20.5		PSI(DEGREES) = 21		PSI(DEGREES) = 22	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.8237 -01	1.0092 +02	5.8736 -01	9.7016 +01	5.8565 -01	9.8347 +01	5.8907 -01	9.5655 +01
15	1.1337 +00	8.9663 +01	1.1381 +00	8.4466 +01	1.1367 +00	8.6735 +01	1.1394 +00	8.2654 +01
20	1.6295 +00	7.8541 +01	1.6227 +00	7.2062 +01	1.6253 +00	7.6271 +01	1.6197 +00	6.9803 +01
25	2.0490 +00	6.7611 +01	2.0168 +00	5.9869 +01	2.0285 +00	6.2509 +01	2.0043 +00	5.7169 +01
30	2.3766 +00	5.6938 +01	2.3029 +00	4.7963 +01	2.3292 +00	5.1023 +01	2.2749 +00	4.4814 +01
35	2.6025 +00	4.6598 +01	2.4712 +00	3.6438 +01	2.5176 +00	3.9941 +01	2.4226 +00	3.2899 +01
40	2.7237 +00	3.6683 +01	2.5206 +00	2.5417 +01	2.5919 +00	2.9254 +01	2.4453 +00	2.1499 +01
45	2.7435 +00	2.7308 +01	2.4577 +00	1.5063 +01	2.5575 +00	1.9225 +01	2.3534 +00	1.0923 +01
50	2.6716 +00	1.8612 +01	2.2976 +00	5.6057 +00	2.4273 +00	1.0009 +01	2.1631 +00	1.1473 +00
55	2.5222 +00	1.0775 +01	2.0610 +00	-2.6150 +00	2.2197 +00	1.8734 +00	1.8979 +00	-7.0944 +00
60	2.3146 +00	4.0321 +00	1.7739 +00	-9.0766 +00	1.9581 +00	-4.7934 +00	1.5870 +00	-1.3178 +01
65	2.0699 +00	-1.3610 +00	1.4661 +00	-1.2937 +01	1.6687 +00	-9.4197 +00	1.2648 +00	-1.5825 +01
70	1.8100 +00	-5.0232 +00	1.1717 +00	-1.2838 +01	1.3802 +00	-1.1160 +01	9.7384 -01	-1.2811 +01
75	1.5564 +00	-6.5521 +00	9.3078 -01	-6.4548 +00	1.1233 +00	-8.8647 +00	7.7032 -01	-1.4511 +00
80	1.3277 +00	-5.5115 +00	7.8879 -01	5.7618 +00	9.3029 -01	-1.4188 +00	7.1125 -01	1.6519 +01
85	1.1396 +00	-1.5407 +00	7.7278 -01	2.1106 +01	8.7017 -01	1.0652 +01	7.9111 -01	3.1720 +01
90	1.0034 +00	5.4352 +00	8.5901 -01	3.3448 +01	8.3093 -01	2.1869 +01	9.4297 -01	3.9770 +01
95	9.2831 -01	1.6881 +01	9.9961 -01	4.0319 +01	9.1131 -01	3.4339 +01	1.1159 +00	4.2651 +01
100	9.1945 -01	2.5400 +01	1.1626 +00	4.3720 +01	1.0412 +00	4.0892 +01	1.2885 +00	4.2555 +01

	PSI(DEGREES) = 23		PSI(DEGREES) = 2		PSI(DEGREES) = 25	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	5.9265 -01	9.2865 +01	5.9637 -01	6.9916 +01	6.0024 -01	8.6870 +01
15	1.1419 +00	7.8911 +01	1.1442 +00	7.5012 +01	1.1461 +00	7.0956 +01
20	1.6126 +00	6.5137 +01	1.6037 +00	6.0275 +01	1.5930 +00	5.5718 +01
25	1.9761 +00	5.1594 +01	1.9437 +00	4.5785 +01	1.9067 +00	3.9744 +01
30	2.2135 +00	3.8374 +01	2.1439 +00	3.1645 +01	2.0664 +00	2.4651 +01
35	2.1151 +00	2.5597 +01	2.1967 +00	1.8000 +01	2.0666 +00	1.0115 +01
40	2.2837 +00	1.3431 +01	2.1075 +00	5.0639 +00	1.9170 +00	-3.5791 +00
45	2.1317 +00	2.1215 +00	1.8938 +00	-6.8017 +00	1.6415 +00	-1.5900 +01
50	1.8810 +00	-7.8830 +00	1.5842 +00	-1.6925 +01	1.2770 +00	-2.5674 +01
55	1.5614 +00	-1.5858 +01	1.2170 +00	-2.3856 +01	8.7475 -01	-2.9891 +01
60	1.2109 +00	-2.0280 +01	8.4556 -01	-2.3909 +01	5.2800 -01	-1.7234 +01
65	8.7498 -01	-1.7076 +01	5.6658 -01	-7.9265 +00	4.6265 -01	2.2763 +01
70	6.5030 -01	-3.0203 +00	5.4550 -01	2.4033 +01	7.0159 -01	4.3082 +01
75	6.2369 -01	2.1432 +01	7.4820 -01	4.0900 +01	9.8267 -01	4.3894 +01
80	7.7255 -01	3.7315 +01	9.9282 -01	4.3413 +01	1.2162 +00	3.8852 +01
85	9.7660 -01	4.2374 +01	1.2081 +00	4.0514 +01	1.3839 +00	3.2099 +01
90	1.1743 +00	4.2076 +01	1.3775 +00	3.5674 +01	1.4868 +00	2.4996 +01
95	1.3476 +00	3.9387 +01	1.5008 +00	3.0124 +01	1.5323 +00	1.8022 +01
100	1.4931 +00	3.5499 +01	1.5814 +00	2.4280 +01	1.5275 +00	1.1325 +01

Table 6

KA=5

DELTA(DEGREES)=25

KB	PSI(DEGREES) = 0		PSI(DEGREES) = 1		PSI(DEGREES) = 2		PSI(DEGREES) = 3	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	6.7759 -01	1.2145 +02	6.7770 -01	1.2139 +02	6.7800 -01	1.2120 +02	6.7851 -01	1.2088 +02
15	1.3262 +00	1.1712 +02	1.3264 +00	1.1706 +02	1.3269 +00	1.1678 +02	1.3257 +00	1.1636 +02
20	1.9269 +00	1.1300 +02	1.9251 +00	1.1290 +02	1.9256 +00	1.1258 +02	1.9264 +00	1.1206 +02
25	2.4680 +00	1.0918 +02	2.4681 +00	1.0905 +02	2.4684 +00	1.0868 +02	2.4688 +00	1.0806 +02
30	2.9461 +00	1.0572 +02	2.9460 +00	1.0558 +02	2.9457 +00	1.0515 +02	2.9452 +00	1.0444 +02
35	3.3565 +00	1.0271 +02	3.3562 +00	1.0255 +02	3.3552 +00	1.0207 +02	3.3534 +00	1.0127 +02
40	3.7021 +00	1.0020 +02	3.7015 +00	1.0003 +02	3.6996 +00	9.9499 +01	3.6963 +00	9.8618 +01
45	3.9907 +00	9.8257 +01	3.9898 +00	9.8066 +01	3.9869 +00	9.7492 +01	3.9819 +00	9.6536 +01
50	4.2344 +00	9.6884 +01	4.2331 +00	9.6679 +01	4.2294 +00	9.6064 +01	4.2229 +00	9.5038 +01
55	4.4482 +00	9.6061 +01	4.4468 +00	9.5843 +01	4.4425 +00	9.5188 +01	4.4348 +00	9.4096 +01
60	4.6481 +00	9.5714 +01	4.6466 +00	9.5482 +01	4.6420 +00	9.4788 +01	4.6333 +00	9.3631 +01
65	4.8486 +00	9.5722 +01	4.8470 +00	9.5477 +01	4.8423 +00	9.4742 +01	4.8340 +00	9.3517 +01
70	5.0596 +00	9.5935 +01	5.0580 +00	9.5675 +01	5.0537 +00	9.4897 +01	5.0457 +00	9.3599 +01
75	5.2859 +00	9.6202 +01	5.2847 +00	9.5926 +01	5.2807 +00	9.5100 +01	5.2732 +00	9.3722 +01
80	5.5270 +00	9.6397 +01	5.5259 +00	9.6105 +01	5.5223 +00	9.5227 +01	5.5150 +00	9.2762 +01
85	5.7776 +00	9.6444 +01	5.7766 +00	9.6134 +01	5.7728 +00	9.5201 +01	5.7654 +00	9.3646 +01
90	6.0290 +00	9.6316 +01	6.0278 +00	9.5987 +01	6.0240 +00	9.4999 +01	6.0159 +00	9.3351 +01
95	6.2730 +00	9.6030 +01	6.2718 +00	9.5683 +01	6.2673 +00	9.4640 +01	6.2577 +00	9.2902 +01
100	6.5026 +00	9.5636 +01	6.5008 +00	9.5271 +01	6.4953 +00	9.4176 +01	6.4838 +00	9.2350 +01

KB	PSI(DEGREES) = 4		PSI(DEGREES) = 5		PSI(DEGREES) = 7		PSI(DEGREES) = 10	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	6.7922 -01	1.2046 +02	6.8013 -01	1.1987 +02	6.8236 -01	1.1836 +02	6.8772 -01	1.1514 +02
15	1.3269 +00	1.1578 +02	1.3286 +00	1.1502 +02	1.3323 +00	1.1301 +02	1.3401 +00	1.0874 +02
20	1.9276 +00	1.1133 +02	1.9290 +00	1.1040 +02	1.9325 +00	1.0790 +02	1.9384 +00	1.0260 +02
25	2.4693 +00	1.0720 +02	2.4698 +00	1.0608 +02	2.4706 +00	1.0312 +02	2.4684 +00	9.6820 +01
30	2.9444 +00	1.0346 +02	2.9431 +00	1.0216 +02	2.9384 +00	9.8747 +01	2.9218 +00	9.1503 +01
35	3.3507 +00	1.0015 +02	3.3468 +00	9.8710 +01	3.3343 +00	9.4877 +01	3.2971 +00	8.6741 +01
40	3.6912 +00	9.7305 +01	3.6842 +00	9.5800 +01	3.6621 +00	9.1576 +01	3.5997 +00	8.2613 +01
45	3.9744 +00	9.5198 +01	3.9640 +00	9.3477 +01	3.9316 +00	8.8893 +01	3.8414 +00	7.9168 +01
50	4.2132 +00	9.3602 +01	4.1996 +00	9.1756 +01	4.1573 +00	8.6837 +01	4.0390 +00	7.6407 +01
55	4.4233 +00	9.2567 +01	4.4071 +00	9.0603 +01	4.3562 +00	8.5366 +01	4.2117 +00	7.4265 +01
60	4.6212 +00	9.2011 +01	4.6032 +00	8.9928 +01	4.5456 +00	8.4375 +01	4.3775 +00	7.2607 +01
65	4.8211 +00	9.1802 +01	4.8022 +00	8.9596 +01	4.7397 +00	8.3712 +01	4.5497 +00	7.1236 +01
70	5.0329 +00	9.1780 +01	5.0136 +00	8.9441 +01	4.9471 +00	8.3200 +01	4.7367 +00	6.9957 +01
75	5.2606 +00	9.1791 +01	5.2410 +00	8.9306 +01	5.1700 +00	8.2674 +01	4.9313 +00	6.8596 +01
80	5.5024 +00	9.1710 +01	5.4820 +00	8.9069 +01	5.4065 +00	8.2017 +01	5.1322 +00	6.7049 +01
85	5.7521 +00	9.1466 +01	5.7299 +00	8.8661 +01	5.6425 +00	8.1172 +01	5.3268 +00	6.5285 +01
90	6.0009 +00	9.1043 +01	5.9755 +00	8.8071 +01	5.8744 +00	8.0141 +01	5.5048 +00	6.3338 +01
95	6.2401 +00	9.0466 +01	6.2102 +00	8.7331 +01	6.0912 +00	7.8968 +01	5.6580 +00	6.1283 +01
100	6.4627 +00	8.9791 +01	6.4272 +00	8.6500 +01	6.2871 +00	7.7725 +01	5.7824 +00	5.9211 +01
105	6.6649 +00	8.9086 +01						

KB	PSI(DEGREES) = 12		PSI(DEGREES) = 14		PSI(DEGREES) = 15		PSI(DEGREES) = 16	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	6.9216 -01	1.1237 +02	6.9739 -01	1.0911 +02	7.0030 -01	1.0729 +02	7.0340 -01	1.0535 +02
15	1.3464 +00	1.0506 +02	1.3534 +00	1.0072 +02	1.3571 +00	9.8311 +01	1.3608 +00	9.5735 +01
20	1.9419 +00	9.8033 +01	1.9442 +00	9.2651 +01	1.9465 +00	8.9655 +01	1.9442 +00	8.6456 +01
25	2.4629 +00	9.1399 +01	2.4520 +00	8.5006 +01	2.4438 +00	8.1446 +01	2.4333 +00	7.7647 +01
30	2.9006 +00	8.5266 +01	2.8617 +00	7.7910 +01	2.8448 +00	7.3815 +01	2.8178 +00	6.9444 +01
35	3.2538 +00	7.9737 +01	3.1893 +00	7.1480 +01	3.1473 +00	6.6885 +01	3.0977 +00	6.1984 +01
40	3.5292 +00	7.4900 +01	3.4267 +00	6.5815 +01	3.3608 +00	6.0764 +01	3.2838 +00	5.5381 +01
45	3.7407 +00	7.0806 +01	3.5957 +00	6.0970 +01	3.5033 +00	5.5511 +01	3.3958 +00	4.9705 +01
50	3.9071 +00	6.7448 +01	3.7177 +00	5.6929 +01	3.5973 +00	5.1106 +01	3.4580 +00	4.4926 +01
55	4.0491 +00	6.4739 +01	3.8149 +00	5.3581 +01	3.6663 +00	4.7424 +01	3.4946 +00	4.0908 +01
60	4.1849 +00	6.2513 +01	3.9057 +00	5.0719 +01	3.7282 +00	4.4233 +01	3.5234 +00	3.7394 +01
65	4.3269 +00	6.0546 +01	4.0002 +00	4.8081 +01	3.7920 +00	4.1248 +01	3.5518 +00	3.4073 +01
70	4.4786 +00	5.8615 +01	4.0988 +00	4.5417 +01	3.8559 +00	3.8208 +01	3.5758 +00	3.0672 +01
75	4.6358 +00	5.6546 +01	4.1933 +00	4.2559 +01	3.9098 +00	3.4949 +01	3.5837 +00	2.7037 +01
80	4.7884 +00	5.4252 +01	4.2712 +00	3.9444 +01	3.9403 +00	3.1432 +01	3.5611 +00	2.3158 +01
85	4.9245 +00	5.1729 +01	4.3157 +00	3.6115 +01	3.9348 +00	2.7727 +01	3.4967 +00	1.9151 +01
90	5.0336 +00	4.9046 +01	4.3299 +00	3.2682 +01	3.8860 +00	2.3980 +01	3.3855 +00	1.5214 +01
95	5.1093 +00	4.6799 +01	4.2986 +00	2.9289 +01	3.7933 +00	2.0374 +01	3.2303 +00	1.1591 +01
100	5.1503 +00	4.3604 +01	4.2286 +00	2.6085 +01	3.6624 +00	1.7088 +01	3.0412 +00	8.5284 +00
							2.0329 +00	6.2379 +00

KB	PSI(DEGREES) = 17		PSI(DEGREES) = 18		PSI(DEGREES) = 18.5		PSI(DEGREES) = 19	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.7470 -01	1.0329 +02	7.13[illegible] -01	1.0111 +02	7.1201 -01	9.9973 +01	7.1388 -01	9.8807 +01
15	1.3645 +00	9.2998 +01	1.3682 +00	9.0099 +01	1.3700 +00	8.8589 +01	1.3718 +00	8.7040 +01
20	1.9430 +00	8.3057 +01	1.9408 +00	7.9457 +01	1.9393 +00	7.7582 +01	1.9375 +00	7.5657 +01
25	2.4206 +00	7.3608 +01	2.4046 +00	6.9331 +01	2.3955 +00	6.7104 +01	2.3855 +00	6.4817 +01
30	2.7857 +00	6.4799 +01	2.7479 +00	5.9881 +01	2.7268 +00	5.7321 +01	2.7040 +00	5.4693 +01
35	3.0397 +00	5.6777 +01	2.9725 +00	5.1269 +01	2.9352 +00	4.8404 +01	2.8954 +00	4.5465 +01
40	3.1947 +00	4.9671 +01	3.0924 +00	4.3640 +01	3.0360 +00	4.0507 +01	2.9760 +00	3.7298 +01
45	3.2721 +00	4.3555 +01	3.1313 +00	3.7081 +01	3.0542 +00	3.3728 +01	2.9725 +00	3.0300 +01
50	3.2984 +00	3.8406 +01	3.1178 +00	3.1573 +01	3.0195 +00	2.8050 +01	2.9157 +00	2.4463 +01
55	3.2987 +00	3.4067 +01	3.0782 +00	2.6944 +01	2.9588 +00	2.3294 +01	2.8333 +00	1.9604 +01
60	3.2904 +00	3.0254 +01	3.0295 +00	2.2881 +01	2.8890 +00	1.9139 +01	2.7421 +00	1.5384 +01
65	3.2793 +00	2.6628 +01	2.9757 +00	1.9019 +01	2.8130 +00	1.5201 +01	2.6438 +00	1.1415 +01
70	3.2591 +00	2.2908 +01	2.9083 +00	1.5073 +01	2.7216 +00	1.1202 +01	2.5285 +00	7.4205 +00
75	3.2165 +00	1.8960 +01	2.8129 +00	1.0946 +01	2.5999 +00	7.0752 +00	2.3814 +00	3.3881 +00
80	3.1372 +00	1.4820 +01	2.6762 +00	6.7559 +00	2.4357 +00	3.0048 +00	2.1916 +00	-4.0456 -01
85	3.0117 +00	1.0673 +01	2.4921 +00	2.8174 +00	2.2254 +00	-5.8290 -01	1.9590 +00	-3.3611 +00
90	2.8388 +00	6.8118 +00	2.2649 +00	-3.8226 -01	1.9775 +00	-3.0196 +00	1.6976 +00	-4.5251 +00
95	2.6261 +00	3.6006 +00	2.0102 +00	-2.1955 +00	1.7133 +00	-3.3801 +00	1.4380 +00	-2.5444 +00
100	2.3894 +00	1.4365 +00	1.7532 +00	-1.8500 +00	1.4670 +00	-5.6168 -01	1.2269 +00	3.9796 +00

KB	PSI(DEGREES) = 20		PSI(DEGREES) = 21		PSI(DEGREES) = 21.5		PSI(DEGREES) = 22	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.1775 -01	9.6386 +01	7.2182 -01	9.3843 +01	7.2392 -01	9.2528 +01	7.2607 -01	9.1184 +01
15	1.3753 +00	8.3821 +01	1.3786 +00	8.0444 +01	1.3801 +00	7.8696 +01	1.3816 +00	7.6910 +01
20	1.9328 +00	7.1659 +01	1.9267 +00	6.7464 +01	1.9229 +00	6.5293 +01	1.9188 +00	6.3075 +01
25	2.3629 +00	6.0068 +01	2.3369 +00	5.5086 +01	2.3215 +00	5.2507 +01	2.3055 +00	4.9871 +01
30	2.6532 +00	4.9237 +01	2.5951 +00	4.3516 +01	2.5631 +00	4.0557 +01	2.5291 +00	3.7533 +01
35	2.8076 +00	3.9368 +01	2.7085 +00	3.2985 +01	2.6546 +00	2.9689 +01	2.5976 +00	2.6324 +01
40	2.8450 +00	3.0355 +01	2.6988 +00	2.3727 +01	2.6199 +00	2.0161 +01	2.5371 +00	1.6533 +01
45	2.7953 +00	2.3237 +01	2.5996 +00	1.5927 +01	2.4950 +00	1.2194 +01	2.3860 +00	8.4198 +00
50	2.6923 +00	1.7127 +01	2.4485 +00	9.6424 +00	2.3195 +00	5.8783 +00	2.1862 +00	2.1253 +00
55	2.5654 +00	1.2145 +01	2.2768 +00	4.7170 +00	2.1261 +00	1.0861 +00	1.9718 +00	-2.4333 +00
60	2.4309 +00	7.5330 +00	2.1010 +00	7.9395 -01	1.9314 +00	-2.5180 +00	1.7603 +00	-5.5472 +00
65	2.2892 +00	4.0841 +00	1.9203 +00	-2.4906 +00	1.7345 +00	-5.2463 +00	1.5509 +00	-7.4358 +00
70	2.1287 +00	3.9437 -01	1.7231 +00	-5.1862 +00	1.5250 +00	-6.9835 +00	1.3355 +00	-7.7265 +00
75	1.9361 +00	-2.9816 +00	1.5005 +00	-6.7078 +00	1.2985 +00	-6.7468 +00	1.1172 +00	-4.8753 +00
80	1.7060 +00	-5.3945 +00	1.2599 +00	-5.5236 +00	1.0764 +00	-2.2876 +00	9.3348 -01	3.9800 +00
85	1.4498 +00	-5.5603 +00	1.0394 +00	1.0362 +00	9.1373 -01	9.2931 +00	8.6653 -01	1.9805 +01
90	1.2027 +00	-1.4241 +00	9.1761 -01	1.4918 +01	9.0574 -01	2.6100 +01	9.7588 -01	3.4984 +01
95	1.0288 +00	9.0156 +00	9.6757 -01	3.1010 +01	1.0671 +00	3.8687 +01	1.2093 +00	4.2149 +01
100	9.9877 -01	2.3768 +01	1.1605 +00	4.0804 +01	1.3155 +00	4.3252 +01	1.4761 +00	4.2503 +01

KB	PSI(DEGREES) = 23		PSI(DEGREES) = 24		PSI(DEGREES) = 25	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.3051 -01	8.8407 +01	7.3514 -01	8.5513 +01	7.3995 -01	8.2503 +01
15	1.3844 +00	7.3218 +01	1.3869 +00	6.9372 +01	1.3889 +00	6.5371 +01
20	1.9091 +00	5.8488 +01	1.8972 +00	5.3709 +01	1.8832 +00	4.8739 +01
25	2.2699 +00	4.4427 +01	2.2293 +00	3.8754 +01	2.1834 +00	3.2856 +01
30	2.4548 +00	3.1292 +01	2.3716 +00	2.4797 +01	2.2794 +00	1.8054 +01
35	2.4745 +00	1.9395 +01	2.3388 +00	1.2210 +01	2.1906 +00	4.7870 +00
40	2.3599 +00	9.1017 +00	2.1677 +00	1.4718 +00	1.9612 +00	-6.2993 +00
45	2.1553 +00	7.9103 -01	1.9095 +00	-6.8432 +00	1.6512 +00	-1.4291 +01
50	1.9081 +00	-5.2161 +00	1.6190 +00	-1.2121 +01	1.3755 +00	-1.7943 +01
55	1.6567 +00	-8.8791 +00	1.3414 +00	-1.3833 +01	1.0422 +00	-1.5764 +01
60	1.4211 +00	-1.0216 +01	1.1038 +00	-1.1541 +01	8.4547 -01	-6.6279 +00
65	1.2040 +00	-9.0796 +00	9.2027 -01	-4.5169 +00	7.6686 -01	8.3409 +00
70	1.0083 +00	-4.2702 +00	8.1570 -01	8.1140 +00	8.2149 -01	2.3665 +01
75	8.6552 -01	6.5326 +00	8.3667 -01	2.3806 +01	9.9112 -01	3.3214 +01
80	8.4682 -01	2.2722 +01	9.9727 -01	3.5139 +01	1.2276 +00	3.5666 +01
85	9.9074 -01	3.6036 +01	1.2461 +00	3.8726 +01	1.4768 +00	3.2770 +01
90	1.2391 +00	4.1117 +01	1.5062 +00	3.6449 +01	1.6813 +00	7.6540 +01
95	1.5090 +00	3.9849 +01	1.7276 +00	3.0771 +01	1.8076 +00	1.[illegible]527 +01
100	1.7422 +00	3.5055 +01	1.8718 +00	2.3625 +01	1.8317 +00	9.9188 +00
			1.9218 +00	1.5585 +01		

Table 7

KA=5
DELTA(DEGREES)=60

	PSI(DEGREES) = 0		PSI(DEGREES) = 1		PSI(DEGREES) = 2		PSI(DEGREES) = 3	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.6723 -01	7.9230 +01	7.6750 -01	7.9168 +01	7.6829 -01	7.8982 +01	7.6961 -01	7.8672 +01
15	1.2894 +00	8.7186 +01	1.2898 +00	8.7103 +01	1.2910 +00	8.6853 +01	1.2929 +00	8.6437 +01
20	1.8110 +00	8.6549 +01	1.8116 +00	8.6448 +01	1.8132 +00	8.6145 +01	1.8159 +00	8.5640 +01
25	2.1874 +00	8.7702 +01	2.1881 +00	8.7583 +01	2.1900 +00	8.7224 +01	2.1933 +00	8.6626 +01
30	2.6073 +00	8.8007 +01	2.6081 +00	8.7870 +01	2.6105 +00	8.7459 +01	2.6143 +00	8.6775 +01
35	2.9259 +00	8.8023 +01	2.9268 +00	8.7869 +01	2.9294 +00	8.7405 +01	2.9337 +00	8.6632 +01
40	3.2732 +00	8.8561 +01	3.2742 +00	8.8389 +01	3.2771 +00	8.7874 +01	3.2818 +00	8.7016 +01
45	3.5681 +00	8.8315 +01	3.5692 +00	8.8126 +01	3.5724 +00	8.7560 +01	3.5775 +00	8.6616 +01
50	3.8588 +00	8.8780 +01	3.8600 +00	8.8574 +01	3.8634 +00	8.7957 +01	3.8688 +00	8.6929 +01
55	4.1410 +00	8.8591 +01	4.1422 +00	8.8369 +01	4.1459 +00	6.7701 +01	4.1516 +00	8.6589 +01
60	4.3914 +00	8.8858 +01	4.3927 +00	8.8619 +01	4.3966 +00	8.7901 +01	4.4026 +00	8.6706 +01
65	4.6594 +00	8.8829 +01	4.6608 +00	8.8573 +01	4.6649 +00	8.7805 +01	4.6711 +00	8.6527 +01
70	4.8861 +00	8.8895 +01	4.8876 +00	8.8623 +01	4.8919 +00	8.7806 +01	4.8982 +00	8.6445 +01
75	5.1344 +00	8.9003 +01	5.1360 +00	8.8714 +01	5.1405 +00	8.7848 +01	5.1469 +00	8.6405 +01
80	5.3507 +00	8.8943 +01	5.3524 +00	8.8638 +01	5.3570 +00	8.7723 +01	5.3635 +00	8.6198 +01
85	5.5758 +00	8.9108 +01	5.5775 +00	8.8787 +01	5.5823 +00	8.7822 +01	5.5888 +00	8.6216 +01
90	5.7887 +00	8.9018 +01	5.7905 +00	8.8681 +01	5.7954 +00	8.7667 +01	5.8019 +00	8.5979 +01
95	5.9918 +00	8.9157 +01	5.9937 +00	8.8803 +01	5.9987 +00	8.7741 +01	6.0051 +00	8.5972 +01
100	6.2016 +00	8.9110 +01	6.2035 +00	8.8740 +01	6.2086 +00	8.7630 +01	6.2149 +00	8.5779 +01

	PSI(DEGREES) = 4		PSI(DEGREES) = 5		PSI(DEGREES) = 7		PSI(DEGREES) = 10	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.7145 -01	7.8239 +01	7.7383 -01	7.7683 +01	7.8019 -01	7.6201 +01	7.9377 -01	7.3065 +01
15	1.2956 +00	8.5854 +01	1.2990 +00	8.5105 +01	1.3082 +00	8.3112 +01	1.3273 +00	7.8893 +01
20	1.8197 +00	8.4934 +01	1.8246 +00	8.4026 +01	1.8372 +00	8.1609 +01	1.8629 +00	7.6491 +01
25	2.1978 +00	8.5789 +01	2.2034 +00	8.4715 +01	2.2179 +00	8.1853 +01	2.2457 +00	7.5795 +01
30	2.6195 +00	8.5817 +01	2.6260 +00	8.4586 +01	2.6422 +00	8.1310 +01	2.6707 +00	7.4375 +01
35	2.9395 +00	8.5551 +01	2.9466 +00	8.4162 +01	2.9635 +00	8.0465 +01	2.9897 +00	7.2640 +01
40	3.2881 +00	8.5815 +01	3.2956 +00	8.4272 +01	3.3126 +00	8.0166 +01	3.3337 +00	7.1479 +01
45	3.5842 +00	8.5296 +01	3.5920 +00	8.3600 +01	3.6084 +00	7.9086 +01	3.6217 +00	6.9537 +01
50	3.8758 +00	8.5491 +01	3.8836 +00	8.3643 +01	3.8985 +00	7.8725 +01	3.9004 +00	6.8330 +01
55	4.1588 +00	8.5034 +01	4.1666 +00	8.3035 +01	4.1792 +00	7.7717 +01	4.1669 +00	6.6479 +01
60	4.4098 +00	8.5033 +01	4.4172 +00	8.2885 +01	4.4267 +00	7.7169 +01	4.3961 +00	6.5101 +01
65	4.6784 +00	8.4739 +01	4.6853 +00	8.2441 +01	4.6908 +00	7.6329 +01	4.6388 +00	6.3434 +01
70	4.9053 +00	8.4541 +01	4.9116 +00	8.2095 +01	4.9119 +00	7.5591 +01	4.8344 +00	6.1878 +01
75	5.1539 +00	8.4386 +01	5.1592 +00	8.1793 +01	5.1537 +00	7.4897 +01	5.0470 +00	6.0374 +01
80	5.3701 +00	8.4064 +01	5.3743 +00	8.1324 +01	5.3618 +00	7.4039 +01	5.2216 +00	5.8711 +01
85	5.5950 +00	8.3968 +01	5.5979 +00	8.1082 +01	5.5774 +00	7.3410 +01	5.4000 +00	5.7290 +01
90	5.8075 +00	8.3618 +01	5.8087 +00	8.0586 +01	5.7792 +00	7.2527 +01	5.5599 +00	5.5614 +01
95	6.0101 +00	8.3497 +01	6.0096 +00	8.0320 +01	5.9699 +00	7.1879 +01	5.7049 +00	5.4192 +01
100	6.2191 +00	8.31[illegible]2 +01	6.2165 +00	7.[illegible]869 +01	6.1655 +00	7.1045 +01	5.8501 +00	5.2578 +01

	PSI(DEGREES) = 15		PSI(DEGREES) = 16		PSI(DEGREES) = 17		PSI(DEGREES) = 20	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	8.2746 -01	6.5447 +01	8.3590 -01	6.3572 +01	8.4492 -01	6.1583 +01	8.7552 -01	5.4937 +01
15	1.3725 +00	6.8643 +01	1.3834 +00	6.6121 +01	1.3947 +00	6.3444 +01	1.4312 +00	5.4505 +01
20	1.9181 +00	6.4054 +01	1.9301 +00	6.0993 +01	1.9420 +00	5.7746 +01	1.9758 +00	4.6901 +01
25	2.2953 +00	6.1085 +01	2.3035 +00	5.7468 +01	2.3102 +00	5.3633 +01	2.3184 +00	4.0844 +01
30	2.7059 +00	5.7546 +01	2.7067 +00	5.3414 +01	2.7041 +00	4.9034 +01	2.6686 +00	3.4464 +01
35	2.9962 +00	5.3672 +01	2.9848 +00	4.9022 +01	2.9671 +00	4.4099 +01	2.8651 +00	2.7767 +01
40	3.2978 +00	5.0464 +01	3.2695 +00	4.5327 +01	3.2311 +00	3.9897 +01	3.0411 +00	2.1980 +01
45	3.5290 +00	4.6475 +01	3.4789 +00	4.0852 +01	3.4140 +00	3.4919 +01	3.1147 +00	1.5462 +01
50	3.7351 +00	4.3305 +01	3.6579 +00	3.7234 +01	3.5608 +00	3.0847 +01	3.1327 +00	1.0118 +01
55	3.9137 +00	3.9495 +01	3.8044 +00	3.2978 +01	3.6697 +00	2.6145 +01	3.0954 +00	4.2435 +00
60	4.0384 +00	3.6248 +01	3.8922 +00	2.9330 +01	3.7145 +00	2.2114 +01	2.9816 +00	-5.4068 -01
65	4.1608 +00	3.2733 +01	3.9731 +00	2.5430 +01	3.7478 +00	1.7856 +01	2.8475 +00	-5.2847 +00
70	4.2195 +00	2.9412 +01	3.9858 +00	2.1771 +01	3.7089 +00	1.3914 +01	2.6391 +00	-9.0631 +00
75	4.2802 +00	2.6209 +01	3.9970 +00	1.8272 +01	3.6658 +00	1.0201 +01	2.4334 +00	-1.1918 +01
80	4.2861 +00	2.2903 +01	3.9499 +00	1.4717 +01	3.5617 +00	6.5147 +00	2.1801 +00	-1.3670 +01
85	4.2828 +00	1.9977 +01	3.8919 +00	1.1626 +01	3.4470 +00	3.4375 +00	1.9511 +00	-1.3234 +01
90	4.2451 +00	1.6827 +01	3.7971 +00	8.3617 +00	3.2949 +00	2.9423 -01	1.7240 +00	-1.1066 +01
95	4.1819 +00	1.4138 +01	3.6773 +00	5.7013 +00	3.1221 +00	-1.9876 +00	1.5590 +00	-5.4315 +00
100	4.1053 +00	1.1300 +01	3.5437 +00	2.9668 +00	2.9387 +00	-4.1658 +00	1.4619 +00	1.7286 +00

	PSI(DEGREES) = 21		PSI(DEGREES) = 22		PSI(DEGREES) = 25	
KB	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	8.8692 -01	5.2499 +01	8.9894 -01	4.9953 +01	9.3872 -01	4.1675 +01
15	1.4441 +00	5.1227 +01	1.4572 +00	4.7804 +01	1.4972 +00	3.6680 +01
20	1.9858 +00	4.2928 +01	1.9947 +00	3.8779 +01	2.0128 +00	2.5312 +01
25	2.3156 +00	3.6166 +01	2.3094 +00	3.1288 +01	2.2642 +00	1.5509 +01
30	2.6451 +00	2.9150 +01	2.6146 +00	2.3621 +01	2.4728 +00	5.8502 +00
35	2.8114 +00	2.1837 +01	2.7460 +00	1.5687 +01	2.4722 +00	-3.8727 +00
40	2.9486 +00	1.5524 +01	2.8396 +00	8.8698 +00	2.4084 +00	-1.1856 +01
45	2.9753 +00	8.5210 +00	2.8148 +00	1.4269 +00	2.2090 +00	-1.9916 +01
50	2.9406 +00	2.8558 +00	2.7237 +00	-4.4456 +00	1.9481 +00	-2.4776 +01
55	2.8460 +00	-3.2473 +00	2.5702 +00	-1.0590 +01	1.6452 +00	-2.8088 +01
60	2.6744 +00	-7.9532 +00	2.3432 +00	-1.4845 +01	1.3429 +00	-2.4869 +01
65	2.4845 +00	-1.2358 +01	2.1055 +00	-1.8311 +01	1.1445 +00	-1.6294 +01
70	2.2285 +00	-1.5195 +01	1.8205 +00	-1.9098 +01	1.1058 +00	-1.2668 +00
75	1.9903 +00	-1.6406 +01	1.5841 +00	-1.7010 +01	1.2584 +00	8.9076 +00
80	1.7284 +00	-1.5318 +01	1.3731 +00	-1.0801 +01	1.4924 +00	1.3715 +01
85	1.5333 +00	-1.0722 +01	1.2967 +00	-9.7764 -01	1.7514 +00	1.2355 +01
90	1.3897 +00	-3.3798 +00	1.3208 +00	9.2129 +00	1.9530 +00	8.8490 +00
95	1.3736 +00	6.4074 +00	1.4788 +00	1.6708 +01	2.1096 +00	3.3214 +00
100	1.4467 +00	1.4491 +01	1.6714 +00	1.9994 +01	2.1623 +00	-2.5758 +00

Table 8

KA=5

DELTA(DEGREES)= ∞

KB	PSI(DEGREES) = 0		PSI(DEGREES) = 1		PSI(DEGREES) = 2		PSI(DEGREES) = 3	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.3901 -01	9.0000 +01	7.3918 -01	8.9936 +01	7.3968 -01	8.9743 +01	7.4053 -01	8.9422 +01
15	1.3061 +00	9.0000 +01	1.3064 +00	8.9917 +01	1.3073 +00	8.9667 +01	1.3087 +00	8.9250 +01
20	1.7841 +00	9.0000 +01	2.2058 +00	8.9880 +01	1.7857 +00	8.9593 +01	1.7878 +00	8.9084 +01
25	2.2053 +00	9.0000 +01	2.5867 +00	8.9863 +01	2.2073 +00	8.9521 +01	2.2098 +00	8.8922 +01
30	2.5861 +00	9.0000 +01	1.7845 +00	8.9898 +01	2.5884 +00	8.9450 +01	2.5913 +00	8.8763 +01
35	2.9362 +00	9.0000 +01	2.9369 +00	8.9845 +01	2.9389 +00	8.9381 +01	2.9421 +00	8.8607 +01
40	3.2621 +00	9.0000 +01	3.2629 +00	8.9828 +01	3.2651 +00	8.9312 +01	3.2685 +00	8.8452 +01
45	3.5682 +00	9.0000 +01	3.5691 +00	8.9811 +01	3.5714 +00	8.9244 +01	3.5751 +00	8.8299 +01
50	3.8578 +00	9.0000 +01	3.8586 +00	8.9794 +01	3.8612 +00	8.9176 +01	3.8651 +00	8.8147 +01
55	4.1331 +00	9.0000 +01	4.1341 +00	8.9777 +01	4.1368 +00	8.9109 +01	4.1408 +00	8.7996 +01
60	4.3963 +00	9.0000 +01	4.3973 +00	8.9761 +01	4.4001 +00	8.9042 +01	4.4043 +00	8.7845 +01
65	4.6486 +00	9.0000 +01	4.6497 +00	8.9744 +01	4.6526 +00	8.8976 +01	4.6569 +00	8.7696 +01
70	4.8915 +00	9.0000 +01	4.8926 +00	8.9727 +01	4.8956 +00	8.8910 +01	4.8999 +00	8.7547 +01
75	5.1258 +00	9.0000 +01	5.1269 +00	8.9711 +01	5.1300 +00	8.8844 +01	5.1343 +00	8.7399 +01
80	5.3524 +00	9.0000 +01	5.3536 +00	8.9695 +01	5.3568 +00	8.8778 +01	5.3610 +00	8.7252 +01
85	5.5720 +00	9.0000 +01	5.5732 +00	8.9678 +01	5.5765 +00	8.8713 +01	5.5806 +00	8.7105 +01
90	5.7853 +00	9.0000 +01	5.7866 +00	8.9662 +01	5.7899 +00	8.8648 +01	5.7938 +00	8.6958 +01
95	5.9927 +00	9.0000 +01	5.9940 +00	8.9646 +01	5.9974 +00	8.8583 +01	6.0011 +00	8.6812 +01
100	6.1947 +00	9.0000 +01	6.1961 +00	8.9630 +01	6.1995 +00	8.8518 +01	6.2030 +00	8.6667 +01

KB	PSI(DEGREES) = 4		PSI(DEGREES) = 5		PSI(DEGREES) = 7		PSI(DEGREES) = 10	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.4171 -01	3.8973 +01	7.4324 -01	8.8396 +01	7.4731 -01	8.6858 +01	7.5599 -01	8.3596 +01
15	1.3108 +00	8.8667 +01	1.3135 +00	8.7917 +01	1.3205 +00	8.5920 +01	1.3351 +00	8.1684 +01
20	1.7906 +00	8.8372 +01	1.7941 +00	8.7456 +01	1.8033 +00	8.5018 +01	1.8216 +00	7.9845 +01
25	2.2132 +00	8.8084 +01	2.2174 +00	8.7007 +01	2.2281 +00	8.4138 +01	2.2478 +00	7.8053 +01
30	2.5951 +00	8.7802 +01	2.5999 +00	8.6566 +01	2.6114 +00	8.3274 +01	2.6301 +00	7.6295 +01
35	2.9463 +00	8.7524 +01	2.9514 +00	8.6132 +01	2.9631 +00	8.2423 +01	2.9781 +00	7.4563 +01
40	3.2731 +00	8.7249 +01	3.2784 +00	8.5702 +01	3.2895 +00	8.1582 +01	3.2981 +00	7.2851 +01
45	3.5799 +00	8.6976 +01	3.5852 +00	8.5276 +01	3.5949 +00	8.0749 +01	3.5943 +00	7.1158 +01
50	3.8699 +00	8.6706 +01	3.8751 +00	8.4854 +01	3.8827 +00	7.9923 +01	3.8696 +00	6.9481 +01
55	4.1457 +00	8.6437 +01	4.1505 +00	8.4435 +01	4.1552 +00	7.9102 +01	4.1263 +00	6.7818 +01
60	4.4090 +00	8.6170 +01	4.4132 +00	8.4018 +01	4.4142 +00	7.8287 +01	4.3661 +00	6.6167 +01
65	4.6614 +00	8.5905 +01	4.6649 +00	8.3604 +01	4.6612 +00	7.7477 +01	4.5903 +00	6.4529 +01
70	4.9041 +00	8.5641 +01	4.9067 +00	8.3191 +01	4.8974 +00	7.6670 +01	4.7999 +00	6.2902 +01
75	5.1382 +00	8.5378 +01	5.1396 +00	8.2780 +01	5.1237 +00	7.5868 +01	4.9958 +00	6.1286 +01
80	5.3643 +00	8.5116 +01	5.3644 +00	8.2371 +01	5.3409 +00	7.5069 +01	5.1787 +00	5.9681 +01
85	5.5834 +00	8.4855 +01	5.5818 +00	8.1964 +01	5.5498 +00	7.4274 +01	5.3491 +00	5.8086 +01
90	5.7958 +00	8.4594 +01	5.7925 +00	8.1557 +01	5.7508 +00	7.3482 +01	5.5075 +00	5.6503 +01
95	6.0023 +00	8.4335 +01	5.9969 +00	8.1153 +01	5.9444 +00	7.2692 +01	5.6543 +00	5.4930 +01
100	6.2032 +00	8.4076 +01	6.1955 +00	8.0749 +01	6.1312 +00	7.1906 +01	5.7899 +00	5.3368 +01

KB	PSI(DEGREES) = 12		PSI(DEGREES) = 15		PSI(DEGREES) = 16		PSI(DEGREES) = 17	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.6353 -01	8.0789 +01	7.7751 -01	7.5637 +01	7.8290 -01	7.3671 +01	7.8866 -01	7.1582 +01
15	1.3474 +00	7.8039 +01	1.3691 +00	7.1390 +01	1.3771 +00	6.8798 +01	1.3855 +00	6.6086 +01
20	1.8359 +00	7.5395 +01	1.8558 +00	6.7230 +01	1.8663 +00	6.4116 +01	1.8736 +00	6.0807 +01
25	2.2613 +00	7.2818 +01	2.2779 +00	6.3221 +01	2.2813 +00	5.9562 +01	2.2831 +00	5.5676 +01
30	2.6397 +00	7.0292 +01	2.6416 +00	5.9295 +01	2.6368 +00	5.5106 +01	2.6284 +00	5.0661 +01
35	2.9804 +00	6.7805 +01	2.9583 +00	5.5439 +01	2.9409 +00	5.0736 +01	2.9170 +00	4.5749 +01
40	3.2893 +00	6.5352 +01	3.2334 +00	5.1646 +01	3.1987 +00	4.6443 +01	3.1538 +00	4.0934 +01
45	3.5703 +00	6.2927 +01	3.4702 +00	4.7912 +01	3.4132 +00	4.2225 +01	3.3417 +00	3.6217 +01
50	3.8263 +00	6.0528 +01	3.6711 +00	4.4235 +01	3.5869 +00	3.8085 +01	3.4832 +00	3.1602 +01
55	4.0593 +00	5.8153 +01	3.8378 +00	4.0618 +01	3.7215 +00	3.4025 +01	3.5802 +00	2.7100 +01
60	4.2708 +00	5.5802 +01	3.9718 +00	3.7063 +01	3.8187 +00	3.0053 +01	3.6347 +00	2.2724 +01
65	4.4619 +00	5.3474 +01	4.0743 +00	3.3574 +01	3.8797 +00	2.6178 +01	3.6486 +00	1.8491 +01
70	4.6336 +00	5.1169 +01	4.1464 +00	3.0157 +01	3.9063 +00	2.2412 +01	3.6241 +00	1.4426 +01
75	4.7867 +00	4.8888 +01	4.1892 +00	2.6919 +01	3.8999 +00	1.8768 +01	3.5638 +00	1.0556 +01
80	4.9218 +00	4.6630 +01	4.2039 +00	2.3569 +01	3.8623 +00	1.5267 +01	3.4703 +00	6.9219 +00
85	5.0394 +00	4.4397 +01	4.1917 +00	2.0419 +01	3.7955 +00	1.1932 +01	3.3469 +00	3.5713 +00
90	5.1400 +00	4.2190 +01	4.1539 +00	1.7382 +01	3.7016 +00	8.7900 +00	3.1972 +00	5.6779 -01
95	5.2241 +00	4.0011 +01	4.0919 +00	1.4474 +01	3.5831 +00	5.8782 +00	3.0255 +00	-2.0070 +00
100	5.2921 +00	3.7860 +01	4.0074 +00	1.1714 +01	3.4428 +00	3.2411 +00	2.8368 +00	-4.0476 +00

KB	PSI(DEGREES) = 18		PSI(DEGREES) = 19		PSI(DEGREES) = 20		PSI(DEGREES) = 21	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	7.9479 -01	6.9369 +01	8.0131 -01	6.7035 +01	8.0820 -01	6.4580 +01	8.1549 -01	6.2003 +01
15	1.3941 +00	6.3215 +01	1.4030 +00	6.0185 +01	1.4121 +00	5.6999 +01	1.4213 +00	5.3657 +01
20	1.8804 +00	5.7305 +01	1.8866 +00	5.3611 +01	1.8920 +00	4.9728 +01	1.8965 +00	4.5656 +01
25	2.2830 +00	5.1565 +01	2.2806 +00	4.7232 +01	2.2756 +00	4.2680 +01	2.2674 +00	3.7911 +01
30	2.6157 +00	4.5963 +01	2.5981 +00	4.1015 +01	2.5749 +00	3.5824 +01	2.5455 +00	3.0394 +01
35	2.8856 +00	4.0485 +01	2.8459 +00	3.4951 +01	2.7967 +00	2.9155 +01	2.7373 +00	2.3108 +01
40	3.0974 +00	3.5129 +01	3.0283 +00	2.9041 +01	2.9453 +00	2.2684 +01	2.8475 +00	1.6078 +01
45	3.2540 +00	2.9901 +01	3.1487 +00	2.3299 +01	3.0246 +00	1.6437 +01	2.8808 +00	9.3494 +00
50	3.3580 +00	2.4813 +01	3.2101 +00	1.7749 +01	3.0384 +00	1.0456 +01	2.8426 +00	2.9951 +00
55	3.4120 +00	1.9882 +01	3.2158 +00	1.2423 +01	2.9914 +00	4.8000 +00	2.7396 +00	-2.8776 +00
60	3.4184 +00	1.5134 +01	3.1695 +00	7.3694 +00	2.8891 +00	-4.4378 -01	2.5802 +00	-8.1093 +00
65	3.3802 +00	1.0604 +01	3.0756 +00	2.6516 +00	2.7383 +00	-5.1530 +00	2.3748 +00	-1.2461 +01
70	3.3007 +00	6.3358 +00	2.9393 +00	-1.6419 +00	2.5470 +00	-9.1513 +00	2.1364 +00	-1.5573 +01
75	3.1837 +00	2.3897 +00	2.7667 +00	-5.3890 +00	2.3255 +00	-1.2183 +01	1.8820 +00	-1.6903 +01
80	3.0339 +00	-1.1548 +00	2.5654 +00	-8.4202 +00	2.0864 +00	-1.3881 +01	1.6348 +00	-1.5687 +01
85	2.8565 +00	-4.1915 +00	2.3445 +00	-1.0500 +01	1.8463 +00	-1.3732 +01	1.4258 +00	-1.1076 +01
90	2.6580 +00	-6.5781 +00	2.1154 +00	-1.1307 +01	1.6269 +00	-1.1115 +01	1.2938 +00	-2.8499 +00
95	2.4458 +00	-8.1250 +00	1.8926 +00	-1.0429 +01	1.4561 +00	-5.5539 +00	1.2706 +00	7.3393 +00
100	2.2293 +00	-8.5865 +00	1.6946 +00	-7.4288 +00	1.3639 +00	2.6160 +00	1.3574 +00	1.6308 +01

KB	PSI(DEGREES) = 22		PSI(DEGREES) = 23		PSI(DEGREES) = 24		PSI(DEGREES) = 25	
	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)	G(B)	PHASE(DEGREES)
10	8.2318 -01	5.9307 +01	8.3127 -01	5.6492 +01	8.3977 -01	5.3559 +01	8.4869 -01	5.0509 +01
15	1.4307 +00	5.0159 +01	1.4400 +00	4.6508 +01	1.4494 +00	4.2705 +01	1.4587 +00	3.8752 +01
20	1.8998 +00	4.1397 +01	1.9018 +00	3.6955 +01	1.9021 +00	3.2330 +01	1.9007 +00	2.7526 +01
25	2.2557 +00	3.2929 +01	2.2401 +00	2.7739 +01	2.2201 +00	2.2344 +01	2.1953 +00	1.6750 +01
30	2.5092 +00	2.4733 +01	2.4654 +00	1.8848 +01	2.4133 +00	1.2749 +01	2.3525 +00	6.4482 +00
35	2.6668 +00	1.6824 +01	2.5844 +00	1.0318 +01	2.4894 +00	3.6101 +00	2.3815 +00	-3.2723 +00
40	2.7339 +00	9.2475 +00	2.6039 +00	2.2253 +00	2.4574 +00	-4.9451 +00	2.2944 +00	-1.2204 +01
45	2.7168 +00	2.0833 +00	2.5326 +00	-5.2958 +00	2.3292 +00	-1.2695 +01	2.1081 +00	-1.9976 +01
50	2.6231 +00	-4.5440 +00	2.3815 +00	-1.2031 +01	2.1209 +00	-1.9264 +01	1.8460 +00	-2.5922 +01
55	2.4628 +00	-1.0442 +01	2.1653 +00	-1.7629 +01	1.8543 +00	-2.4002 +01	1.5613 +00	-2.8807 +01
60	2.2485 +00	-1.5311 +01	1.9033 +00	-2.1512 +01	1.5600 +00	-2.5770 +01	1.2446 +00	-2.6447 +01
65	1.9964 +00	-1.8675 +01	1.6218 +00	-2.2720 +01	1.2832 +00	-2.2728 +01	1.0354 +00	-1.6307 +01
70	1.7283 +00	-1.9787 +01	1.3593 +00	-1.9806 +01	1.0922 +00	-1.3079 +01	1.0049 +00	-6.8880 -01
75	1.4747 +00	-1.7570 +01	1.1709 +00	-1.1427 +01	1.0596 +00	1.0309 +00	1.1574 +00	1.1109 +01
80	1.2783 +00	-1.0951 +01	1.1165 +00	1.0771 +00	1.1910 +00	1.2345 +01	1.4008 +00	1.5260 +01
85	1.1882 +00	-3.6135 -01	1.2112 +00	1.2338 +01	1.4144 +00	1.7261 +01	1.6509 +00	1.4031 +01
90	1.2304 +00	1.0734 +01	1.4054 +00	1.8529 +01	1.6567 +00	1.7169 +01	1.8597 +00	9.8476 +00
95	1.3807 +00	1.8454 +01	1.6355 +00	1.9978 +01	1.8725 +00	1.4084 +01	2.0016 +00	4.1581 +00
100	1.5878 +00	2.1865 +01	1.8568 +00	1.8279 +01	2.0360 +00	9.3540 +00	2.0643 +00	-2.1418 +00

Table 9.

$a_o = + 1.595769140$	$b_o = - 0.000000033$	$c_o = 0$	$d_o = + 0.199471140$
$a_1 = - 0.000001702$	$b_1 = + 4.255387524$	$c_1 = - 0.024933975$	$d_1 = + 0.000000023$
$a_2 = - 6.808568856$	$b_2 = - 0.000092809$	$c_2 = + 0.000003936$	$d_2 = - 0.009351341$
$a_3 = - 0.000576361$	$b_3 = - 7.780020406$	$c_3 = + 0.005770956$	$d_3 = + 0.000023006$
$a_4 = + 6.920691905$	$b_4 = - 0.009520896$	$c_4 = + 0.000689892$	$d_4 = + 0.004851466$
$a_5 = - 0.016898657$	$b_5 = + 5.075161301$	$c_5 = - 0.009497136$	$d_5 = + 0.001903218$
$a_6 = - 3.050485662$	$b_6 = - 0.138341946$	$c_6 = + 0.011948809$	$d_6 = - 0.017122914$
$a_7 = - 0.075752420$	$b_7 = - 1.363729125$	$c_7 = - 0.006748873$	$d_7 = + 0.029064067$
$a_8 = + 0.850663781$	$b_8 = - 0.403349276$	$c_8 = + 0.000246420$	$d_8 = - 0.027928955$
$a_9 = - 0.025639041$	$b_9 = + 0.702222017$	$c_9 = + 0.002102967$	$d_9 = + 0.016497308$
$a_{10} = - 0.150230960$	$b_{10} = - 0.216195929$	$c_{10} = - 0.001217930$	$d_{10} = - 0.005598515$
$a_{11} = + 0.034404779$	$b_{11} = + 0.019547031$	$c_{11} = + 0.000233939$	$d_{11} = + 0.000838386$

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